

CITY WIDE STUDIES

PART I

BASIC FACTORS IN THE PLANNING

OF THE



CITY OF NEW YORK

1934 - 1938

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CITY-WIDE STUDIES
PART I
BASIC FACTORS
IN
THE PLANNING
OF THE CITY OF NEW YORK



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1940

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PREFACE

The reports published in these volumes, now available for the first time for general distribution through the cooperation of the Work Projects Administration of New York and the duplicating facilities made available by the Board of Education, have both historic and current interest. Historically the reports represent one of the larger examples of the impact of the depression of the 1930's upon the objectives, methods and subject matter of city planning, for they are the result of an extensive WPA project, and represent for the most part work that would never have been done otherwise. Currently, they are being put to the test of practical application, by virtue of the unique machinery for local planning established under New York City's new Charter, for they constitute one of the principal reservoirs of objective fact immediately available to this new agency.

Under any ordinary circumstances, the word "historic" would hardly be applicable to an activity which originated within the decade. But the tempo of events during the depression, the new direction imparted to many activities, including city planning, as a by-product of the emergency measures taken to cope with the depression, do perhaps justify its use here.

Prior to the 1930's city planning proceeded as a rule under the guidance of professional planners with but limited staff assistance. The depression simultaneously curtailed the financing of this type of planning organization, and made available funds (in terms of technical personnel drawn from the relief rolls) for basic factual studies far in excess of any that the earlier planners had to draw upon. At the same time the depression not only high-lighted numerous urban problems hitherto scarcely recognized, but presented compelling arguments for their early solution. It is hardly to be wondered at, therefore, that city planning, among numerous other elements of our national life, underwent substantial change once the paralyzing effects of the early depression years had been shaken off and its potential aid in the solution of these problems began to be realized.

✓ Mayor LaGuardia assumed office in New York City on January 1, 1934. During ✓ his campaign he stressed the need for modern city planning in the solution of the city's problems. Within a few weeks after taking office, he had called upon the late Bernard S. Deutsch, newly elected President of the Board of Aldermen, to take the matter in hand. President Deutsch promptly called a conference of leading citizens for advice in the matter, and the Mayor shortly thereafter designated a Mayor's Committee on City Planning to undertake such active and advisory work as might be initiated prior to the authorization of a permanent planning body as an integral part of the city government.

This Mayor's Committee promptly recognized two principal opportunities as inherent in its assignment. The first of these was to make recommendations for an adequate permanent city planning agency for the city; the second was to assemble such facts and prepare such reports as might best advance the operation of such an agency when established.

With the first of these we are not here concerned. The Committee's recommendations were duly presented to the Charter Revision Commission, as a result of whose deliberations, ratified by popular referendum, there now exists in New York City a planning agency whose development is attracting wide-spread interest.

The second objective of the Mayor's Committee proved, in the long run, its major interest, for the course of events decreed that four years should elapse before the official agency established under the new Charter should take office.

Planners are generally agreed that the solution of any set of problems should proceed *both* from the large and general to the local and specific, and *vice versa*. It is obvious that the nature of the total city may largely determine the character of its individual communities; and the development of the several communities comprising the city similarly influence the structure as a whole. The limited staff assigned to the Committee by the FERA in July, 1934, initiated a number of basic studies of the structure of the Greater City. Within a year, however, the greatly enlarged staff and resources available under the Federal WPA made it possible for the Committee to undertake a series of community studies, so that both types of studies were simultaneously explored.

The city-wide studies of the Mayor's Committee were destined to embrace a larger field of subject matter than had hitherto been customary in city planning projects. It was felt that emphasis should be transferred from such public services as have in the past frequently engaged primary attention, namely, traffic facilities, transit, recreation, and the like—to the very essence of the city itself, its reasons for existence as an economic and social entity, with detailed investigation of the size, location, condition, and general adequacy of the residential areas and the business and industrial districts where the people live and work.

A second extension of customary planning procedure consisted in the translation of all these sets of facts into terms of available and potential financial resources, indicative of the extent and speed of possible realization of the program of public works developed in the course of the planning studies. There was thus created not only a total capital expenditures program for a period of years, but a preliminary integration between proposals involving public outlays and the fiscal status and prospects of the city.

The special circumstances prevailing during this depression period resulted in other valuable, if unprecedented, activities. One of its by-products in New York, as in numerous other cities throughout the country, was the Real Property Inventory. This systematic tabulation of facts about buildings of all kinds throughout the city provided the opportunity for reorientation of the city planning program which was sought by the Mayor's Committee. It meant that the housing of the city could be analyzed as to quantity as well as quality; that this vital element in the city structure could be considered from the point of view of practical economics; that similar quantitative tests could be applied to the areas devoted to business and industry as well.

Arrangements were made with the New York City Housing Authority, under whose auspices the Real Property Inventory was nearing completion in the summer of 1934, by which the staff assigned to the Mayor's Committee promptly set to work

analyzing and giving graphic representation to the many facts in the Inventory which could be used to advantage in the city planning program.

The details of this process are recorded elsewhere in this report. Suffice it to say here that there resulted a series of maps and analyses which proved more informative as to the city's essential structure than any that had been theretofore assembled.

One field of primary concern to planners was not entered upon at all as a matter of original research by the Mayor's Committee, namely that of population. Technicians qualified for original work of this sort were not available, and in New York considerable work had been done in this field in recent years. It was early agreed to adopt the latest revised estimates of the Regional Plan Association, anticipating an ultimate population for the city of slightly over nine million, not on the assumption that this was necessarily correct, but in the belief that it would probably be found not greatly in error. It was further felt that by basing all conclusions upon this single prediction, suitable adjustment could be made whenever further facts indicated a different figure.

While unprecedentedly large staffs were available through the work relief administrations, these abnormal conditions imposed some significant limitations on their operation. Chief among these were the lack of adequate direction, made all the more necessary by the many unskilled and inexperienced workers, and the inadequacy of funds for materials and equipment. Hence the claim has been made that such "white-collar" projects did little more than accumulate vast quantities of useless facts. It is hoped that the publication of these reports will aid in counteracting such impressions. The sponsoring group did, to be sure, make some rather exceptional arrangements for obtaining the assistance of trained directing personnel, without which no highly technical undertaking can be successful. It is a pleasure to report, on the other hand, that the assigned personnel responded with a quality of work which in many respects measures up to that done under normal conditions.

But an appraisal of the contribution of such a project to the development of city planning should not be based alone upon the efficiency of the staff, or even its direction. It is a distinctly tenable hypothesis that much, if not all, of the city planning work done in prior decades suffered from an excess of expert direction as compared with routine staff assistance. The planner-consultant usually had to produce results in a reasonably short time on a distinctly limited budget. He had no opportunity, even if he felt the need and had the inclination, to explore the underlying facts exhaustively. His sources were, of necessity, largely secondary.

Our situation was the direct opposite. We faced the necessity of mapping out a program consisting largely of routine operations that would be useful in a city planning program. It proved not at all difficult to do so. In retrospect, even with full recognition of the limitations of these particular studies, of errors of omission and commission, the conclusion seems inescapable that the city planning process has been enriched, if not largely reoriented, by such chance opportunities for broadening the base of research upon which it proceeds.

This tribute to the constructive contribution of the Work Projects Administration in the field of city planning leads naturally into other acknowledgments of assistance without which this undertaking could not have been successfully completed.

To Mayor LaGuardia is due acknowledgment not only for initiating the whole undertaking, but for the continuing timely support without which it could not have survived on numerous occasions. To the members of the Mayor's Committee on City Planning, who met at frequent intervals throughout the whole four-year period with no incentive other than participation in what appeared to them an important piece of work, should go the sense of accomplishment which follows any civic enterprise well done. To the Spelman Fund of New York and to the Regional Plan Association, both of whom aided materially in ensuring the absolutely essential item of skilled direction for the work, acknowledgments are equally due.

To the technical director, F. Dodd McHugh, and to the project engineer, Frank Klopff, are due the credit for the effective organization, direction and operation of the large staff. During the two years 1934-1936 Mr. McHugh supervised the staff and translated general programs into work schedules. Thereafter Mr. Klopff assumed these responsibilities. As technical director, Mr. McHugh also drafted reports and edited these City-Wide Studies and, ably assisted by Mr. Klopff, developed new planning techniques and made other substantial contributions to these studies. To T. T. McCrosky, who served as general consultant, acknowledgment for valuable advice and assistance is due. To the staff itself, which often put into the work much more than could possibly be paid for, final thanks must be given.

The studies here published, and the much larger volume of underlying material produced in connection therewith, have long since been put to practical use by the official City Planning Department established by the new Charter of the City of New York on January 1, 1938. Publication at this time, therefore, is a step toward meeting the many requests that have been received for copies of the individual reports and of the series as a whole, and has been arranged in the hope that they may prove of interest not only to those active in the affairs of this City, but also to those who are developing the science and art of city planning elsewhere.

LAWRENCE M. ORTON

CITY-WIDE STUDIES — PART I

BASIC FACTORS IN THE PLANNING OF THE CITY OF NEW YORK

FOREWORD

The reports published in this volume belong to a series, prepared for the Mayor's Committee on City Planning of the City of New York, on studies made during the years 1934-1938, with the aid of the United States Work Projects Administration project number 465-97-3-96.

The Preface in this volume states the general purpose of these City-Wide Studies and the practical arrangements under which these reports were produced. The City-Wide series, in three parts, reports upon one of the few recorded efforts to conduct comprehensive city planning studies in this country. This Part contains reports on industrial, population, residential areas, zoning, and special studies. Part II, "The Planning of Public Services for the City of New York," considers those public services that must be studied in the planning of the city and in the programming of city expenditures for permanent improvements. Part III, "Programming Public Improvements in the City of New York," examines the city's ability to finance needed permanent improvements in the future, and suggests a long-term outlay program for public works within the financial resources indicated.

Purpose

At its inception in 1934, the staff of the Mayor's Committee on City Planning was directed, among other things, to lay the groundwork for a master plan through relevant city-wide studies, and to consider municipal finances in connection with public works planning. Provisions of the present Charter, which was adopted in 1936 and became effective January 1, 1938, gave especial emphasis in these city-wide studies to the basic factors which, in part, determine a long-term program of permanent improvements that would provide for the city's indicated future development.

The Charter established a City Planning Commission to advise and report upon all matters affecting the growth of the city. In addition to custody of the city map, review of subdivision, waterfront and drainage plans, and zoning duties, the Commission is responsible for the preparation, and modification to meet changing conditions of a master plan embracing a long-range program for the improvement of the city. The Commission also prepares an annual capital budget and a 5-year capital program that together schedule capital expenditures for six years. The Charter requires that all assessable improvements costing more than \$10,000 must be considered by the City Planning Commission prior to final authorization by the Board of Estimate.

As mentioned in the Foreword by Mr. Lawrence M. Orton, the studies reported in this volume attempted to ascertain the economic, social and physical nature of the city and, within the inherent limitations, to forecast its future outlook.

The reports included in this Part were drafted at the various dates mentioned in the several chapters. Changing conditions have subsequently modified some of

the data upon which these studies were based. The original reports on industry, population and zoning have been extensively rewritten, but it was not practicable to undertake the revisions necessary to bring these studies up-to-date.

Acknowledgments

General acknowledgments are included in the Preface. Unfortunately it is not possible to mention all members of the staff who played responsible parts in the several studies. Mr. T. T. McCrosky, who served as general consultant, collaborated in the development of techniques in the population and zoning studies, and drafted the original reports on population, residential areas and zoning. Mrs. Eunice S. Bischof, author of "Visualized Economic Geography," rendered material assistance in the analysis of industrial trends within New York City and drafted that portion of the original report. It is also a pleasure to express my appreciation to Mr. Arthur C. Holden for suggestions which led to the revision of the industrial study chapter. Mr. Frank J. Klopff, Project Engineer, was largely responsible for the effective organization and supervision of the staff, and rendered valuable technical assistance in carrying out these studies.

Grateful acknowledgment is made to the Board of Education of the City of New York in the reproduction of this report, and to the many public agencies that made essential information available to the staff.

Finally, I wish personally to acknowledge the cooperation and aid of the Department of City Planning in the publication of this material.

F. DODD McHUGH,
Technical Director

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Status and Trends of Industry

INTRODUCTION

In 1923 the Regional Plan of New York and Its Environs surveyed the manufacturing industry of New York City and the metropolitan area. These studies traced the growth and indicated the size and relative importance of the principal industries of the Region, and their geographic trends from 1900 through 1922. The Mayor's Committee on City Planning, believing that these studies, if brought up to date, would contribute greatly to its analysis of the city's problems, authorized this extension of the previous survey.

The Regional Plan studies of industry in the city were based upon records of the New York State Labor Department, the only source of information on industrial plant locations. Through the generous cooperation of the State Labor Department, the Mayor's Committee had access to the factory inspection records. When the staff commenced transcribing these data, in the fall of 1935, the oldest records available were for the year 1929, and the most recent information was for the year 1935. Accordingly these two years were selected for study.

After transcribing the factory inspection records, the data were summarized in the eleven groups employed by the Regional Plan survey, so as to permit comparisons with this earlier study, and to obtain a running picture of industrial trends extending over the thirty-five years from 1900 to 1935.

The Regional Plan Committee spotted on maps the locations of food, chemical, men's wear, metal, printing, textiles, tobacco, women's wear, and wood products plants for the years 1900, 1912, 1917 and 1922. The 1929 and 1935 data were spotted likewise to show the distribution of plants graphically for those years as well.

To determine the relative importance of manufacturing industry in New York's economy, the staff analyzed the decennial reports of the Federal occupational census from 1890 to 1930. The results of this investigation as well as studies of port commerce are summarized in this report. The United States Biennial Census of Manufactures was also studied to ascertain the position of industry in New York City relative to trends in the entire country, and in certain states and other large cities.

It was, unfortunately, not feasible to include in this report all of the tabulations, graphs and the several spot maps made during the course of these studies. These materials are on file and may be consulted by applying to the Department of City Planning and the Work Projects Administration for the City of New York. For additional information on these economic studies, see "Progress Report—1936" of the Mayor's Committee on City Planning, and the section on "Docks" in *The Planning of Public Services for the City of New York*, Part II of the City-Wide Studies of the Mayor's Committee on City Planning. This study of *Status and Trends of Industry* was completed in 1937 prior to the release of data on the 1937 Census of Manufactures, and the original report was drafted in February, 1938. It has not been possible to bring this report up-to-date, but it is believed that publication of the material will enhance the value of previous studies and provide a basis for further discussion and investigation.

NEW YORK AS A PORT

New York's harbor is one of the best in the world and has many features that have favored the development of port activities. First, there is the long waterfront, 771 miles including the Jersey shore, with abundant room for the construction of docks and terminals. The natural depth of the water is sufficient for the average ship, the Upper Bay and the Hudson are broad and safe, the channel from the principal docks to the open sea is only about 20 miles, and the tidal range is slight. The port, never icebound, is open throughout the entire year and fogs are relatively infrequent.

The long waterfront results from the location of three islands between the peninsulas formed by the series of rivers flowing into New York Bay. Of these, the Hudson River is by far the most important and the tidal connection to Long Island Sound known as the East River is second in importance. The original city located on the southern tip of Manhattan Island possessed inland water connection, in the days when this was important, with northern New Jersey as well as the interior of New York State and the sound shore of Connecticut. The opening of the Erie Canal in 1825, linking the Great Lakes with the Hudson River, assured the dominant commercial position

of the city and established the principal trade routes of the nation that were to be followed by the railroads of a later generation.

Local Transfer

In the days when most transportation was by water, the long waterfront and the intercepting rivers were advantageous to both commerce and intercommunication. With the advent of the railroads, the intercepting waterways remained the essential basis of the port, but they produced a local transfer problem which remains one of the most difficult that confronts the city today. The first attempt at solution was by means of an elaborate system of carfloats, tugs, lighters, and ferries. The second phase began with the opening of the Brooklyn Bridge ⁽¹⁾ in 1888, and has continued to the present time. The vehicular tunnels to New Jersey perhaps mark the beginning of another phase. The increasing possibilities of motor truck transfer and motor truck long hauls are creating street traffic and loading problems of increasing proportions.

The terminal and transfer centers of New York have aided in the development of centers of manufacture which have risen and fallen with the change in relative importance of terminal and transfer facilities. Lower Manhattan continues to dominate in industrial importance. The New York Central Railroad Company's west side improvement has opened up the possibility of platform shipment and delivery services for warehouse and factory by a transcontinental carrier. The way seems cleared for a modern efficient development which will reduce the wastes of transfer between ocean freight and local and transcontinental carriers. The Bush Terminal project in south Brooklyn should be remembered as one of the leading attempts to organize the meeting of water and rail-borne commerce and to supply the necessary facilities for warehousing and factory processing. The industrial sections of Brooklyn and Queens, in the latter particularly the section adjacent to the Sunnyside railroad yards, have shown rapid growth in recent years. The industrial sections of The Bronx have suffered from lack of planning. The filling in of the Jersey meadows and rapid development of arterial highways leading into New Jersey have opened up new pos-

sibilities, particularly for the relocation and growth of heavy industries west of the Hudson River. The city proper faces the problem of adaptation of its obsolete facilities to the needs of modern manufacturing and shipping processes. It is a problem calling for a careful coordination of public and private improvements.

INDUSTRY AND POPULATION

The decennial population census reports upon the occupations of "persons gainfully employed". An analysis of these statistics reveals that 27 percent of the city's population, ten years old and over, was gainfully employed in 1890; 42 percent in 1900; 45 percent in 1910 and 1920; and by 1930 the gainfully occupied were 46 percent of the city's population.

The results of staff analyses, made to determine the number of persons occupied as well as the percentages of the total employed in the major occupational classifications, are shown graphically by Figure 1. Due to the changes made from one census to another in the types of occupations comprising the various groups, the staff was unable to place these analyses on the same basis as the Census of Manufactures reports on industrial employees. For example, the Manufacturing and Mechanical Industries group shown on Figure 1 includes mechanics in the building trades but excludes railroad workers. The former group is not reported, but that portion of the latter classification employed in railroad repair shops is included in the Census of Manufactures. While the Biennial Census of Manufactures tabulates only those employees in plants with a production above \$5,000 per year, the decennial population census reports all gainfully occupied persons.

Such circumstances make it impossible to compare the information in Figure 1 directly with the Census of Manufactures data. Table 2 shows that in 1919 industrial employees in the city represented 7.06 percent of all employees in United States industries, and 6.38 percent in 1929, the nearest reports to the last two decennial censuses. Figure 1 shows that of total persons employed, Manufacturing and Mechanical workers in New York City declined from 37.6 percent in 1920 to 32.1 percent in 1930.

Figure 1 is of interest, however, because it reveals the general importance of the manufacturing industry as an employer in New York City. Although the number of manufacturing and mechanical workers has increased, in relation to other occupations, these workers have fallen from nearly

(1) Six great bridges now span the East River and one the Hudson. There are eighteen lines of track under the East River and six under the Hudson. Two vehicular arteries have been built under the Hudson, a third tunnel recently built under the East River connects Manhattan with Long Island, and another tunnel now under construction will provide vehicular connection between downtown Manhattan and Brooklyn.

PERSONS EMPLOYED IN NEW YORK CITY

DATA FROM U.S. BUREAU OF THE CENSUS

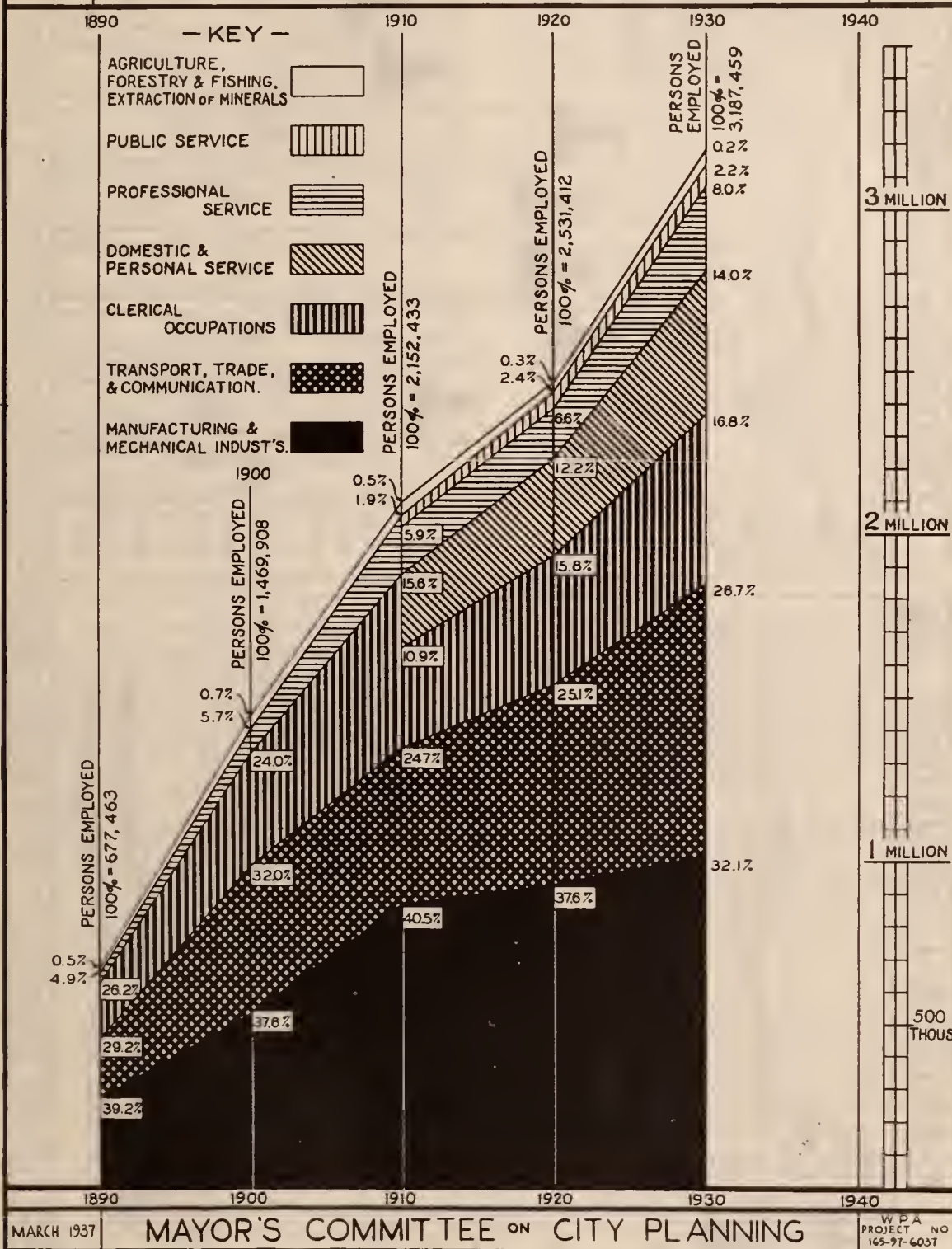


FIG. 1

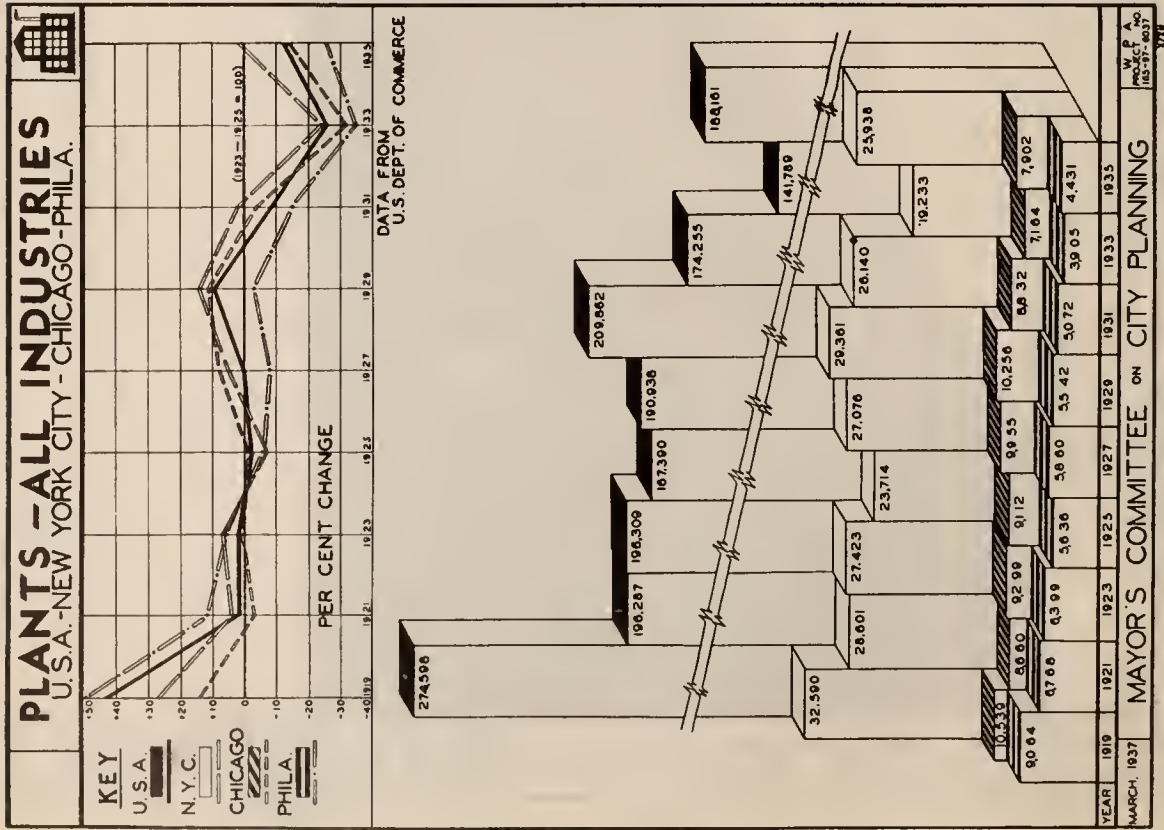


FIG. 2

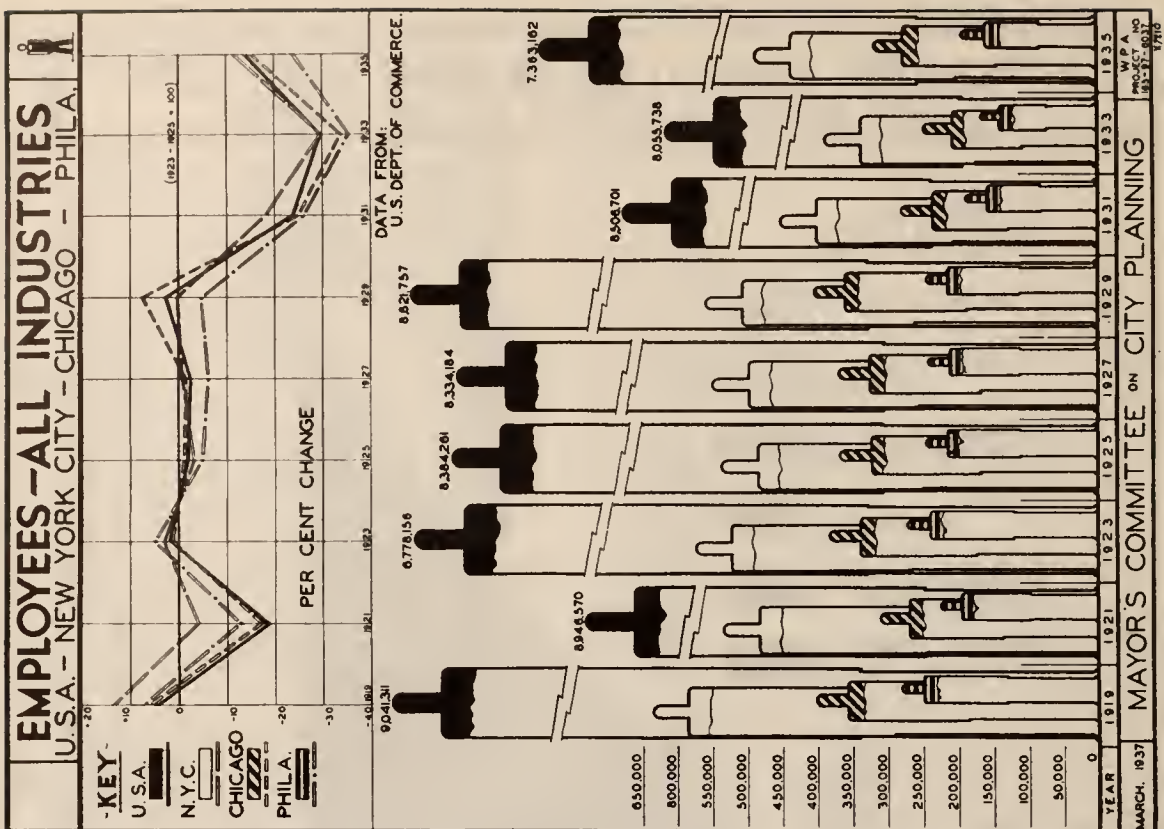


FIG. 3

40 percent of the total employed in 1890 to about one-third by 1930. But even with this relative decline, these workers were the largest occupational group in the city during this forty-year period.

These statistics do not, of course, reflect depression conditions, nor will similar data be available prior to the release of 1940 Census returns. Measured in terms of the proportion of industrial employees in the city to the entire country, Table 2 indicates that New York is not a declining manufacturing city. On the basis of these facts, it would appear that New York's diversified industry will probably continue its position as employer of a major portion of the city's gainfully occupied workers.

In planning for necessary public works and services and for the most desirable utilization of land, due consideration must be given to the needs of industry for the most efficient operating conditions. It is also patent that the relation of industrial districts to residential areas will have to be carefully studied in rezoning the city, in order that the advantages which New York offers to industry may be increased insofar as is consistent with the social, economic and general welfare of its inhabitants.

COMMERCE AND INDUSTRY

Through the Port of New York flows the principal stream of international commerce, resulting from the industrial and agricultural activities of a nation of some 130 million people. Despite the recent decline of foreign commerce, the activities of the port today still amount to approximately twice the tonnage of any other American port, and more than one-fifth of the tonnage handled in the nation's foreign trade passes through the Port of New York. In value the foreign trade of New York exceeded four billion dollars in 1936,

or more than twice that of any other city of the United States. It is well above one-half of the value of the country's entire foreign trade. ⁽²⁾

Although the pre-eminence of the Port of New York is due to foreign trade, it is also an important center for coastal shipping. Its location made it the meeting point in early days for the fish and manufactured products of New England and the agricultural products of the South. The access by Long Island Sound to New England was of great advantage to coastwise shipping.

The commerce of the port has been productive of some of the city's great industrial development, for the metropolitan area is the logical point at which to process the many raw materials which are unloaded at its piers. For this reason, New York is one of the leading centers of sugar refining, coffee roasting, tea blending, and cigar and cigarette manufacturing in the country. Moreover, the millions of people living in the area must have food, clothing and shelter. Thus New York has become the greatest clothing center in the country and an important center for baked goods, confectionery and meat products. Each of these industries is discussed in detail below.

INDUSTRY IN NEW YORK AND ELSEWHERE

As a general center of industry, New York City is the largest in the United States. Since the establishment of the United States Census of Manufactures, New York has been steadily gaining in the ratio of industrial plants located within the city to those located in the rest of the country, as may be seen from Table 1.

(2) For the value and tonnage of foreign and coastwise trade at the Port of New York, and for the entire country, see Table 51 and the chapter on "Docks" in *The Planning of Public Services for the City of New York*, Part II of the City-Wide Studies of the Mayor's Committee on City Planning.

TABLE 1
Number of Plants in All Industries
(Data from the United States Census of Manufactures)

Census Year	United States	New York City	Percent of U. S.	Census Year	United States	New York City	Percent of U. S.
1919	274,598	32,590	11.87	1929	209,862	29,361	13.98
1921	196,267	26,801	13.65	1931	174,255	26,140	14.94
1923	196,309	27,423	13.98	1933	141,769	19,233	13.57
1925	187,390	23,714	12.65	1935	169,111	26,061	15.40
1927	190,938	27,076	14.17				

The number of industrial employees fluctuated more widely in the same period, but the city's share did not vary greatly from 7 percent of the country's total at any time. The figures are given in Table 2.

Wages paid in New York City have been within the range of 7.69 to 9.30 percent of all industrial wages in the United States between 1919 and 1935. Table 3.

The value of products manufactured in New York City and the entire country also furnishes a measure of industrial activity. Although subject to minor fluctuations, the value of products reported as manufactured in the city was more than 8 percent of the value of all industrial production in the United States during the entire period 1919-1935. Table 4.

TABLE 2
Number of Employees in All Industries
(Data from the United States Census of Manufactures)

Year	United States	New York City	Percent of U. S.
1919	9,041,311	638,775	7.06
1921	6,946,570	536,665	7.73
1923	8,778,156	577,971	6.58
1925	8,384,261	538,843	6.43
1927	8,334,184	552,507	6.63
1929	8,821,757	561,814	6.36
1931	6,506,701	453,950	6.98
1933	6,055,736	391,391	6.46
1935	7,378,845	485,144	6.59

TABLE 3
Wages Paid in All Industries
(Figures in Millions of Dollars)
(Data from the United States Census of Manufactures)

Year	U. S. A.	N. Y. C.	% of U. S.	Year	U. S. A.	N. Y. C.	% of U. S.
1919	10,461.7	805.8	7.69	1929	11,607.2	910.5	7.85
1921	8,202.3	762.5	9.30	1931	7,173.2	655.0	9.29
1923	11,009.2	849.9	7.73	1933	5,261.5	438.7	8.34
1925	10,729.9	844.6	7.88	1935	7,513.5	582.2	7.75
1927	10,835.9	904.6	8.35				

TABLE 4
Value of Products—All Industries
(Figures in Millions of Dollars)
(Data from the United States Census of Manufactures)

Year	U. S. A.	N. Y. C.	% of U. S.	Year	U. S. A.	N. Y. C.	% of U. S.
1919	62,193.4	5,260.7	8.46	1929	69,960.9	5,908.2	8.45
1921	43,653.2	4,328.1	9.92	1931	41,038.4	4,163.4	10.14
1923	60,555.9	5,310.0	8.77	1933	31,358.8	2,860.6	9.12
1925	62,713.7	5,324.4	8.50	1935	45,283.3	3,666.2	8.10
1927	62,278.1	5,722.0	9.19				

Comparison of Plants and Employees

Figure 2 shows the *number of plants* in the United States, New York City, Chicago and Philadelphia for all industries, as well as the percent change based upon an index which uses the average conditions for the years 1923-1925 as equal to 100. Figure 3 shows the *number of employees* and percent change for the same geographic areas.

Reference to these charts will reveal that New York not only predominates as a manufacturing city, but that its 1935 activity was just above "normal" in respect to the plant index, while the other areas were still below 100. Measured by the employee index New York, at minus 13.1 percent, was also nearer to normal than the other areas. Both of the charts show, however, that the index of activity for the year 1929 had not been regained in any of these sections by the year 1935. The 1937 Census of Manufactures, when available, will indicate more recent conditions. Based upon a sampling of representative groups, the Bureau of Labor Statistics reports the monthly index of factory employment and payrolls for the country and the states, but not by cities.

Figures 2 to 7 are based upon analyses of the United States Census of Manufactures, which included all plants with an output valued at \$500 or more per year in 1919. Starting with the year 1921, however, the Census excluded plants with a production valued at less than \$5,000 annually,

which partially accounts for the decline shown on these charts between 1919 and 1921. The 1935 data were obtained from preliminary reports and are, therefore, subject to correction. However, an inspection of the final figures shows that these corrections are of such a minor nature that they will not alter the percent change or index figures shown on Figures 2 to 7.

The number of industrial establishments and the index of trends, based upon the 1923-1925 average, for the United States, the states of New York, New Jersey and Connecticut, and New York City are shown graphically on Figure 4. Of these areas, the city was second only to the nation and New York State in the number of establishments between the years 1919 and 1935. Reference to this chart will reveal that the plant index in these geographic areas has remained fairly even, although the New York City index was the only one above 100 in 1935.

In the number of employees in these areas, New York City was second only to the entire country and New York State. The 1935 index of employees, however, was minus 13.1 percent for New York City and minus 11.4 percent for Connecticut; but lower in the other areas. Figure 5.

Inasmuch as the charts have been considerably reduced from the original drawings, Table 5 containing the 1935 number of plants and employees and the percent change for each of the geographic areas included in Figures 2 to 7, will be of interest.

TABLE 5
Plants and Employees in All Industries in Various Areas—1935
(Based upon preliminary figures of 1935 U. S. Census of Manufactures compared with the 1923-1925 average as equal to 100)

Geographic Area	Plants		Employees	
	Number	% Change	Number	% Change
United States	168,181	- 12.3	7,363,182	- 14.2
New York City	26,061	1.9	485,144	- 13.1
Chicago	8,062	- 12.5	317,505	- 15.8
Philadelphia	4,425	- 26.5	201,725	- 22.5
Connecticut	2,853	- 7.8	224,086	- 11.4
Illinois	12,090	- 15.0	537,783	- 15.2
Massachusetts	8,316	- 19.0	442,649	- 29.7
Pennsylvania	13,050	- 28.2	841,234	- 19.7
New Jersey	7,468	- 12.0	377,078	- 13.7
New York State	33,638	- 6.0	895,991	- 19.2

Figure 6 shows the relation of plants in New York City to plants in Pennsylvania, Illinois, Massachusetts and the United States. In these areas the city was second only to the entire country in the number of establishments between 1919 and 1935. Again New York City was the only area in which the 1935 plant index was above "normal". In respect to the number of employees, the city's position was not as consistent. Figure 7 shows the fluctuations in the relative positions of these areas since 1919, in respect to the number of employees. It is of interest to note that while New York City was in fourth place in number of employees, its employee index was higher in 1935 than in the other areas.

It is obvious that the figures for New York City, viewed alone and without regard to the effects of the economic depression, would appear to support the conclusion that the city is losing its industries. No such conclusion is borne out by the foregoing comparison with industry in the country as a whole. On the contrary, it is apparent that New York City is holding its own and has shown a greater degree of stability than have other manufacturing centers and states.

Although there has been an increase in the number employed compared with 1931, the total number of wage earners in the city falls considerably short of the number continuously employed between 1919 and 1929. In two of the industries studied, women's wear and printing, there however were more employees in 1935 than at the peak of prosperity. Only in the production of tobacco and wood products was the number of workers in 1935 very far below the number employed in 1929. Figure 8.

The decline in the total number of plants from 1929 to 1935 was more noticeable than was the decline in the total number of employees. In the women's wear industry, the number of plants compared with 1929 decreased while the number of employees increased. In the food industries, on the other hand, the reverse was true. Figure 9. Detail studies, beyond the scope of these investigations, need to be undertaken to ascertain the meaning of these trends.

In five of the six industries in which numbers of employees per plant were studied, the average number of employees had fallen relative to 1900 and 1917. The exception was the men's wear industry, where the average number of employees per plant was greater than at any time previously. Figure 10. Further trends in size of plants will be discussed later.

These facts are in themselves important, but it would be productive to compare the conditions in New York City industries with trends in the same industries of other cities.

In a later section of this report the recent trends of particular industries in the city will be traced. As a preliminary to the discussion of detailed developments, attention must be given to the city's broad industrial pattern.

THE INDUSTRIAL PATTERN

Although New York is the largest manufacturing center of the United States, between three-fifths and four-fifths of the area of the city is predominantly residential in character. The problem of the industrial pattern of the city is to determine those areas which are particularly advantageous to industry and where the facilities offered as well as the convenience of access to housing for industrial workers are such that present industrial trends are likely to persist.

Briefly summarizing the trends within New York's leading industries (identical to those included in the Regional Plan Survey, and representing about three-fourths of the workers in the city's manufacturing industries), it is evident that *lower Manhattan*, offering accessibility to buyers and to a supply of labor, is New York's principal industrial center. With the exception of knit goods, light metals, heavy machinery and most of the branches of chemical production, all of the industries studied have more of their employees in lower Manhattan than in any other section of the city. In eight out of twenty industries or branches of industries, over 50 percent of the employees were working in Manhattan in 1935. Practically all of the remaining industries, petroleum and explosives excepted, had from one-fifth to 40 percent of their workers in this section. Women's clothing, men's furnishings, small textile wares, hats and caps, and large printing plants, all find lower Manhattan especially fitted to their needs.

The future of lower Manhattan as an industrial center will depend in part upon the ability of future generations to cope with the difficulties encountered in adapting the older buildings and narrower streets to more modern needs. The present congested facilities are due to narrow lots that have been closely built up with inadequate provision for light, air and circulation. These difficulties affect not only industrial space and the efficient shipment and receipt of goods but the homes needed for industrial workers. One of the great problems of the future will be the provision

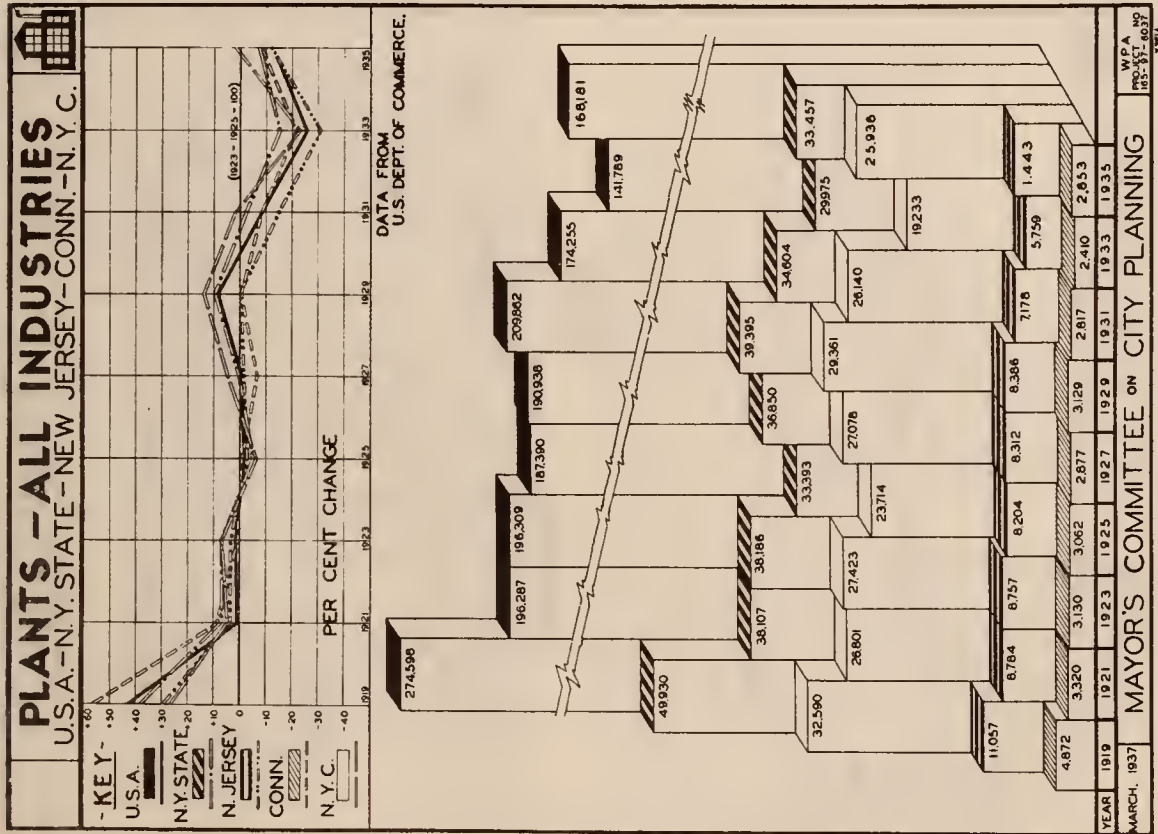


FIG. 4

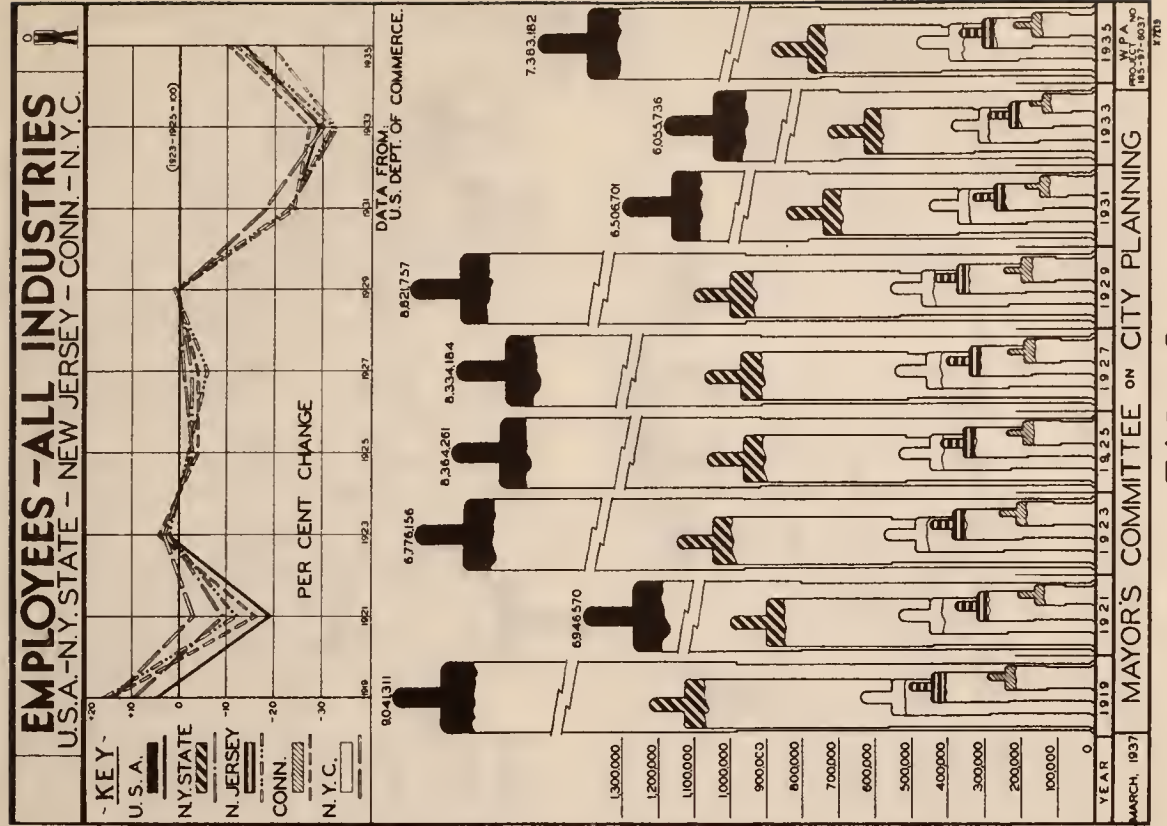


FIG. 5

PLANTS - ALL INDUSTRIES

U.S.A. - PENNA. - ILLINOIS - MASS. - N.Y.C.

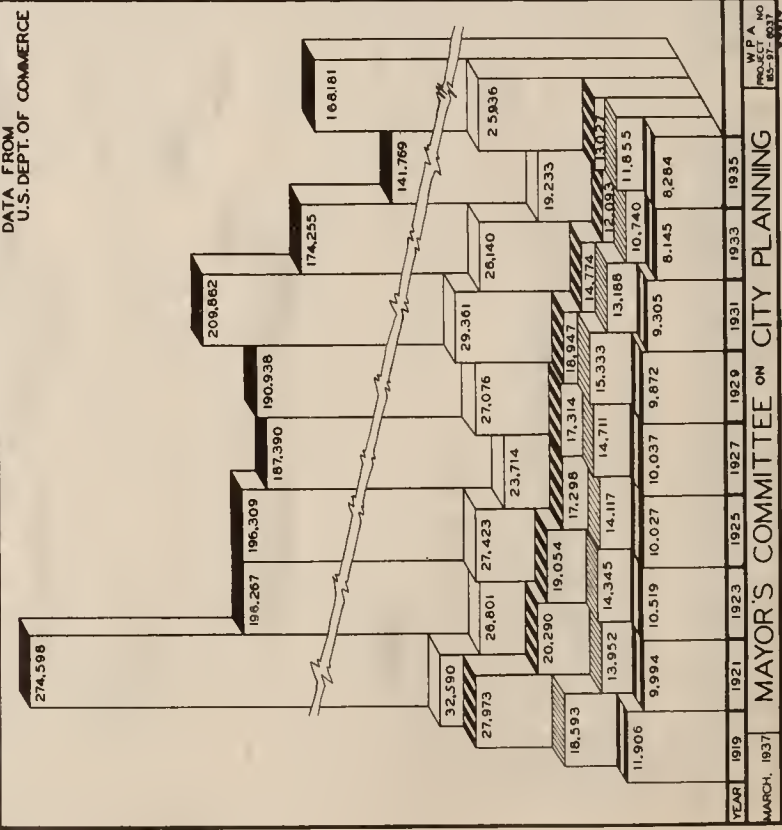
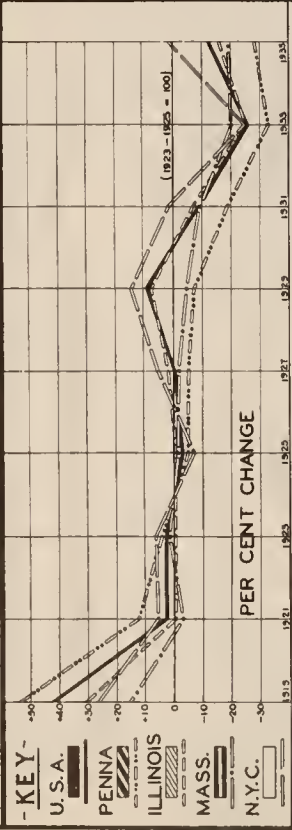


FIG. 6

EMPLOYEES - ALL INDUSTRIES

U.S.A. - PENNA. - ILLINOIS - MASS. - N.Y.C.

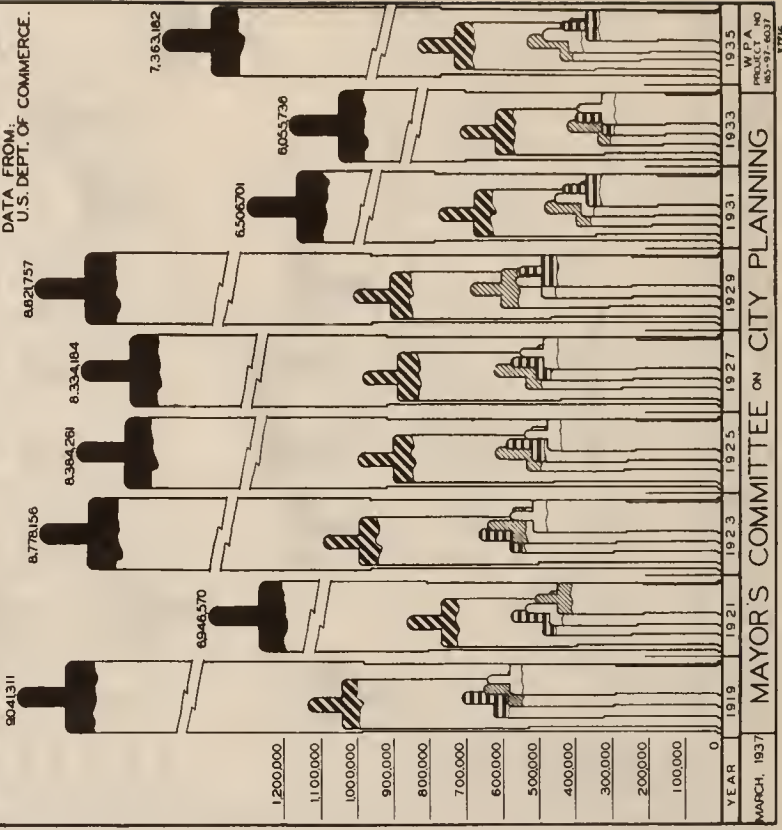
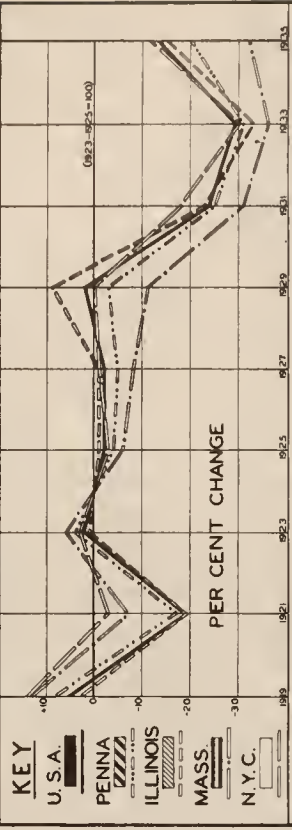


FIG. 7

of adequate housing comparable in desirability to that available in the outlying districts. Most of the present housing in the central section is obsolete both as to design and arrangement. The narrow old law buildings are supplied only with sub-standard sanitary equipment, they have insufficient light and air and are badly located in relation to recreational facilities. The old tenements furthermore are crowded between industrial and commercial buildings in the same block with the result that the atmosphere of a residential neighborhood has been destroyed.

While lower Manhattan is still the leading industrial district in the city, its relative importance compared with other boroughs is decreasing and the number of workers employed in this section is declining. There are a few exceptions to this, namely the women's garment industry, the production of small textile wares, the finishing branch of the textile industry, and the production of soap and toilet preparations. It is evident that while Manhattan may lose its supremacy in the future, it will undoubtedly continue as an important center for manufacturing.

Statistics dealing with such broad areas as *upper Manhattan and The Bronx* are not very satisfactory.⁽³⁾ But from the analysis of maps representing a number of industries, it appears that most of the industrial development in this section is in The Bronx. In the case of women's wear, men's clothing, shirts, and printing plants with twenty or more employees, Manhattan north of 42nd Street is more important than is The Bronx. However, all of the industries just mentioned except men's clothing are becoming increasingly important in The Bronx. This is also true of the small wares branch of textiles, jewelry, toilet preparations and the petroleum industry. Although The Bronx is not now very important industrially, and the number of workers in many of the industries is declining, it appears that the future may see something of a development of the garment and textile industries in this borough.

It has not been possible to make individual analyses of *Brooklyn and Queens* since, with the exception of the metal industry, statistics for these

boroughs were not summarized separately for this report. Brooklyn and Queens together rank next to lower Manhattan in industrial importance. Some industries, for example women's wear, are growing quite rapidly in this section. Figure 30. In the chemical and metal industries, over one-half of the workers are employed in these two boroughs. In the metal industry, Brooklyn is more than twice as important as Queens. Brooklyn is also more important as a center for large printing establishments, women's wear and men's wear.

From the analysis of maps showing the location of manufacturing establishments in New York, it is evident that most of the industrial activity in Brooklyn and Queens is located along the East River, particularly around Newtown Creek. Most of the plants in Queens are near to the Brooklyn boundary, but there are some in the Flushing Bay section. In Brooklyn there are more plants in Bay Ridge and Coney Island than there were formerly. Although these sections can scarcely be called industrial districts, the garment industries are growing quite rapidly, particularly in Bay Ridge. The section around Broadway, Myrtle and Atlantic Avenues is becoming much more important in both the women's wear and the men's wear industry. The Jamaica Bay section of Brooklyn and Queens is very little developed, and might be a good section for future expansion if it were needed and feasible to provide adequate transportation facilities.

Since 1922 some industries, such as men's shirts, hats and caps, heavy machinery and petroleum have been declining in both actual and relative importance. Other industries, including women's garments, the finishing branch of textiles, miscellaneous textiles, technical instruments, all branches of the chemical industry and large printing plants, have more employees than they had in 1922, and are also seeking Brooklyn and Queens more in preference to other boroughs. Figure 30. On the whole it appears likely that a number of industrial districts may develop in Brooklyn and Queens in the future.

Summarizing for the entire city, there is evidently not so much of a movement of industry in or out of the city as there is a shifting of industries from one section to another. New York is usually thought of as a city of dense population. Strictly speaking, however, this is true only of Manhattan and certain sections of The Bronx and Brooklyn. Many parts of The Bronx, Brooklyn and Queens are relatively undeveloped and offer

(3) Moreover, it was difficult to analyze trends in industries which are dominated by a few big concerns. In such cases the movement of one or two large plants may lead to erroneous conclusions as to trends in an industry or to the growth or decline of some section of the city. An instance of this is the manufacture of explosives, where there were 71 percent of the workers in upper Manhattan, The Bronx and Richmond in 1922 and in 1929 there were none. This is explained by the movement of two plants, with 160 employees. Such a great change in percentage of the employees in any borough in an industry where small plants dominated would, of course, be much more significant.

opportunities for future industrial expansion as well as residential development. The borough with the greatest undeveloped space is Richmond. Few statistics have been summarized for this borough, but those that were prepared give some evidence of increased industrial activity in Staten Island. For example, there has been a growth of most branches of the metal industry. On the other hand, some industries such as the finishing branch of the textile group have declined in Richmond.

Dynamic Factors in the Location of Industry

This study includes an analysis of industrial trends in New York City, but there are a number of factors influencing activity here which have not been studied. Probably one of the most important of these factors is the *depression*. Unfortunately, the statistics available for this period are not entirely comparable. The State Labor Department has summarized its 1932 Factory Inspection records for the metropolitan area (New York City, Long Island, Rockland and Westchester Counties), and its 1936 records for the city alone, by group classifications that generally agree with the United States Census of Manufactures. While these two industrial classifications do not agree with the Regional Plan groupings used in this analysis, a detailed study of these data would be fruitful. For example, in a number of industries nearness to a supply of cheap or skilled labor has been stressed as a factor accounting for localization in the city. With the large numbers of unemployed during the depression, was there such a plentiful supply of labor everywhere that this factor was no longer important? If so, was there a tendency to move to sections where other conditions, such as cheap land, might also be found? It would be interesting to know how these changing labor conditions operated in New York compared with other centers of industry.

Another problem which should be studied is the influence of the depression on luxury industries compared with those producing necessities. In fact, there are a number of phases of changing consumer demand that should be considered. We should know, for example, which of New York's industries are most subject to the vagaries of fashion. What effect does the instability of an industry due to fashion changes have on the economic life of the community as a whole?

Exhaustion of raw materials or the use of substitutes may radically affect production trends in an industry. For example, in 1923 it was found

that the decline in the wood industry in New York was partly attributable to the declining supplies of lumber and the resulting increase in the use of substitutes. In the analysis of the sugar refining industry in New York the suggestion was made that any increase in the production of beet sugar would bring about a reduction in the refining of sugar in New York. This is due to the fact that while cane sugar should be refined at a point like New York where the raw sugar and coal meet, beet sugar is refined near the point of production. Changes in raw material supplies such as these just mentioned should be studied in connection with any detailed investigation of industrial trends.

The use of substitutes or decline in the supply of raw materials is sometimes due to new tariffs. For example, increased production in beet sugar would very likely follow any increase in the tariff on sugar. An increased tariff on copper ore would probably result in a decrease in copper refining in the New York area, since most of the copper which is refined here is not domestic but imported. Possibly a number of industries where raw materials are processed might be affected in a similar way. Other forms of legislation might influence industrial trends. For example, zoning ordinances might account for the absence of an industry in a given section of the city. Labor laws in New York State might drive an industry to other states where laws are more lenient.

Labor conditions in an industry are, of course, also affected by the activities of unions. For example, it is often said that the organization of the garment and textile trades is driving these industries outside of the city. To what extent is this true? Is it a temporary phenomenon which has no lasting effect when the areas to which an industry moves have also been unionized? Questions such as these need to be considered in more extensive investigations.

Changes in the organization of an industry are likely to have an effect on localization. For example, the jobber-contractor relationship which has existed for some time in the garment trades has accounted in part for the concentration of a large portion of the industry in the center of the city. A change in this relationship would possibly bring about a decentralization of the industry. The analysis to date suggests that such trends may be under way.

The degree of monopoly control exercised in an industry is often of importance in determining its location. An instance of this is the case of

certain drug manufacturers who have remained in the center of the city although the needs of the industry did not demand such a location. In such cases any increase in competition might necessitate closer attention to costs and result in a search for cheaper land.

A change in the relative importance of the labor factor might also result in a movement of industry. For example, the increased use of machinery in the cigar industry brought a decline in the demand for skilled labor which resulted in a movement of the industry out of the city. In some industries an increase in the use of machinery has also caused a decline in the use of obsolete buildings.

There are a number of unpredictable factors affecting the localization of industry. Some of these such as ignorance and personal idiosyncrasies do not lend themselves to economic analysis. It might, however, be possible to determine the extent to which they interfere with the operation of laws or principles governing the localization of industries. Other factors such as forms of land tenure and the use of obsolete buildings can and should be studied, for in planning the development of any section of the city these factors must be taken into consideration.

Localization of industry and transportation are closely related. Dr. Haig, in his discussion of the assignment of activities to areas in urban regions, goes into some detail on this subject. He points out that of two cities, otherwise alike, the better planned from the economic point of view is the one in which costs of friction (transport costs and site rentals) are less. ⁽⁴⁾

The question that arises then is *what has been the effect of recent changes in our transportation system first on transportation costs and on site rentals and second on New York City industries?* The need to consider the effect of possible modifications in the transportation pattern on industrial development was recognized when the first study was made. It was impossible to attack the problem at the time, but it should be done as soon as possible.

The period from 1922 to 1935 has witnessed many changes in the transportation system of the metropolitan area. Further modifications are constantly being made, and should be considered—for example, the influence of the Holland Tunnel. Today it is possible for large trucks to travel back and forth between Manhattan Island and New Jersey and points West, with much less time and

effort than was formerly expended. Has this condition stimulated or depressed industrial development in Manhattan? What has been the effect on the Jersey side of the river? What will be the influence of the new Lincoln Tunnel? ⁽⁵⁾ How have the George Washington and the Triborough Bridges affected the localization of industry? The Independent Subway has been opened since the Industrial Survey was made in 1923. Has it to any degree relieved congestion in our city? A number of new highways, such as the West Side Express Highway, have been constructed in the past ten years. Have they to any extent furthered the process of decentralization? If not, what has been their effect? Other transportation developments include attempts to reduce congestion in the harbor. Any alleviation of the problems of freight transfer might be an important factor in determining whether an industry would remain in the city or move to the Jersey side of the river.

It seems reasonable to assume that these various improvements might result in a greater decentralization of industry. Has this been the case? This subject should be investigated, for additional changes in the transportation system of the city are being contemplated. If they are to be planned intelligently we should know how the changes, which have already been executed, have affected existing conditions.

There are probably other factors which might throw light on industrial trends, but certainly those which have just been mentioned are all worthy of additional consideration. Facts in themselves are of little value unless they can be interpreted and used to throw light on the problems which confront us. This analysis of the 1929 and 1935 statistics points to the need of additional facts and further interpretation, and it is hoped that this broad study will stimulate the many detail investigations needed for a better understanding of New York's industrial status.

INDUSTRIAL TRENDS WITHIN NEW YORK

The Mayor's Committee on City Planning has recognized the need for correlating such information as exists respecting industrial trends within the city. Three principal sources of information were available: (a) The Industrial Survey undertaken by the Regional Plan of New York and Environs in 1923; (b) New York State Factory Inspection Records 1900 to 1935; and (c) The Census of Manufactures 1919 to 1935.

(4) Regional Survey of New York and Its Environs, Vol. I, page 39.

(5) This query might also be applied to the Brooklyn-Battery Tunnel now under construction.

The purpose of the Industrial Survey of 1923 was to learn: (1) the amount and character of the space requirements of the various economic activities in the metropolitan area; and (2) the changes that had taken place in the space demands of these activities. An analysis of conditions was made to bring out probable causes of existing trends and the probable future importance of the industries studied. The industries selected for analysis were: chemicals, foods, metals, men's clothing, women's clothing, printing, textiles, tobacco and wood. They included 71 percent of all the plants, and 79.5 percent of all the employees listed by the State Factory Inspectors.

The summary of the Industrial Survey of 1923 reported that the peak of manufacturing in the center of the city had been passed in the early 1920's and that a process of decentralization seemed to be under way. Considerable disparity was evident in the trends of the industries studied. Industries where the process of decentralization was most evident in 1925 included *cigar making*, which was said to be "doomed to be crowded off Manhattan". *Wood industries* showed a decline in this region and were expected to continue to decline. The marketing areas for *sugar refining* and *bakeries* were both expected to contract. There was, moreover, an indication of a trend of food plants to cheaper land. Fabrication in the branches of *women's clothing*, where style is of relatively slight importance, was not expected to offer great resistance to decentralizing influences. *Men's clothing* was thought to be more likely to move to outer areas than women's clothing. The possibility of a decline in textiles was predicted. In the chemical industry a trend away from the center was likewise indicated.

While these industries or branches of industries were expected to move outward, it was thought probable that certain phases of manufacturing would hold to the center of the city. The outstanding examples of this need for central location were the *cloak and suit*, and *dresses and waists* branches of the women's clothing industry, and *newspapers* and *job printing*. In the case of clothing, the importance of style is the factor which held the industry to that section of the city where style changes make themselves felt most quickly. In printing, accessibility is likewise of major importance. The desire to be near to the market and to a large labor supply also accounts for the location of some bakeries in the center of the city.

The Mayor's Committee on City Planning deemed it essential to employ more recently available statistics to trace the further development of these industries and the elements of stability and

factors of change in the economic life of New York. The study of the Committee, however, did not include the whole metropolitan area, as did the earlier survey, but was necessarily limited to New York City.

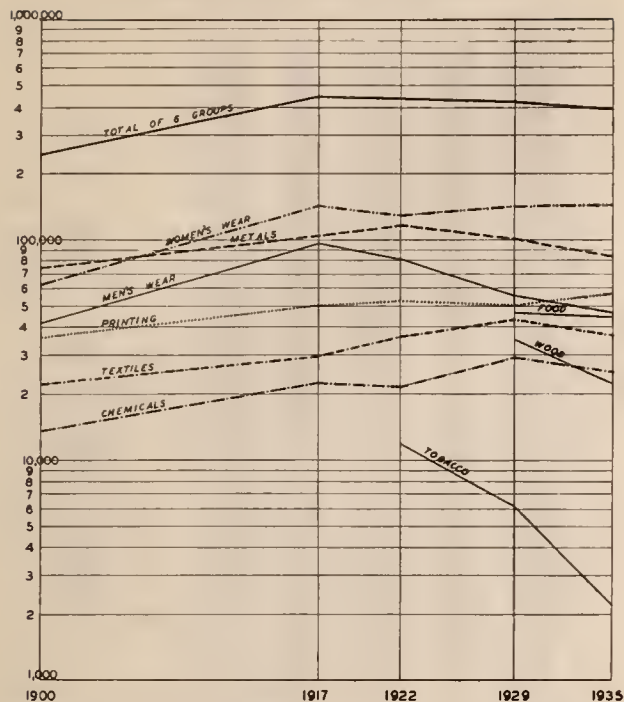
When mention is made of New York City industries, clothing and textiles come to mind instantly. This great metropolis, with its abundant supply of labor, its great market and large capital resources available for speculation, is peculiarly adapted to these trades. The importance of the labor factor is admirably described in the following quotation from the Regional Survey Report for 1923: "New York is an immigrant city; the clothing trades use almost no other labor. . . . The idiosyncrasies of those newly arrived people are expressed by the clothing trades at almost every point. Their untiring ambition, their intense individualism, their willingness to engage in cut-throat competition, their willingness to embark themselves among the risks of unstandardized and speculative enterprises, have all been thoroughly exploited. Slums and ghettos, obsolete and unsanitary working places, congested selling districts, have been among the building materials with which the immense local structure of the clothing trades has been reared. . . . The country comes here to inspect and choose, because here it can profit by New York's readiness to speculate on changes, combined with New York's extraordinary labor supply, and can obtain here what can be got nowhere else so cheaply, in such abundance, and in comparable variety".⁽⁶⁾

A knowledge of the role played by fashion and style changes in these industries is also essential to an understanding of their pre-eminence here. New York is today the fashion center of America, for the United States turns to its chief metropolis as "the logical index market for styles and fashions".⁽⁶⁾ Any changes in styles, and they are numerous, are first felt in New York.

The element of change due to the importance of the style factor necessitates a flexible form of organization in the industry. In both the women's garment and the men's clothing industries this need for flexibility has resulted in the jobber-contractor system. Under this arrangement the jobber buys the raw materials, determines designs, and stores and sells the product. The contractor fabricates the material and sometimes suggests the designs. This system has resulted in a large number of small shops and generally chaotic conditions within the industry.

(6) Regional Survey of New York and Its Environs, Vol. IB, The Clothing and Textile Industries, page 15.

NUMBER OF EMPLOYEES IN NINE NEW YORK CITY INDUSTRIES

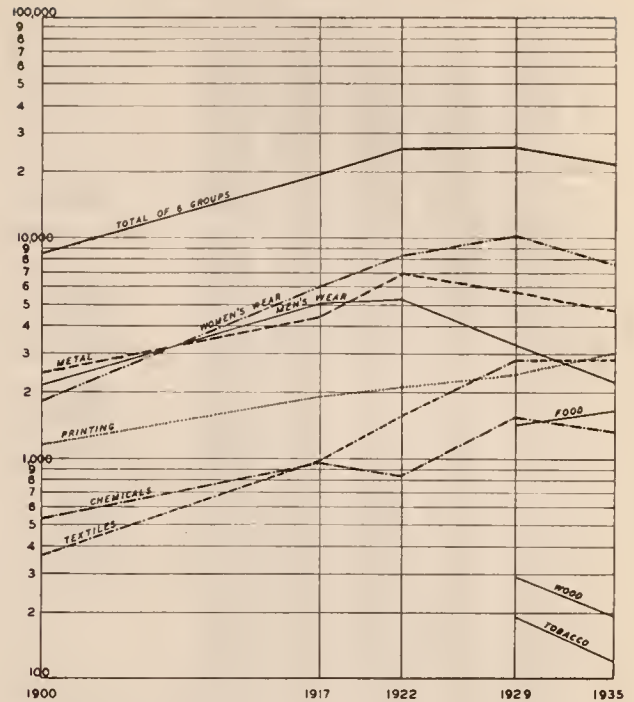


DECEMBER, 1937

FIG. 8

TO PREPARE A MASTER PLAN
W.P.A. PROJECT NO. 465-97-3-96

NUMBER OF PLANTS IN NINE N.Y.C. INDUSTRIES



DECEMBER, 1937.

FIG. 9

TO PREPARE A MASTER PLAN
W.P.A. PROJECT NO. 465-97-3-96

AVERAGE NUMBER OF EMPLOYEES PER PLANT IN 6 NEW YORK CITY INDUSTRIES

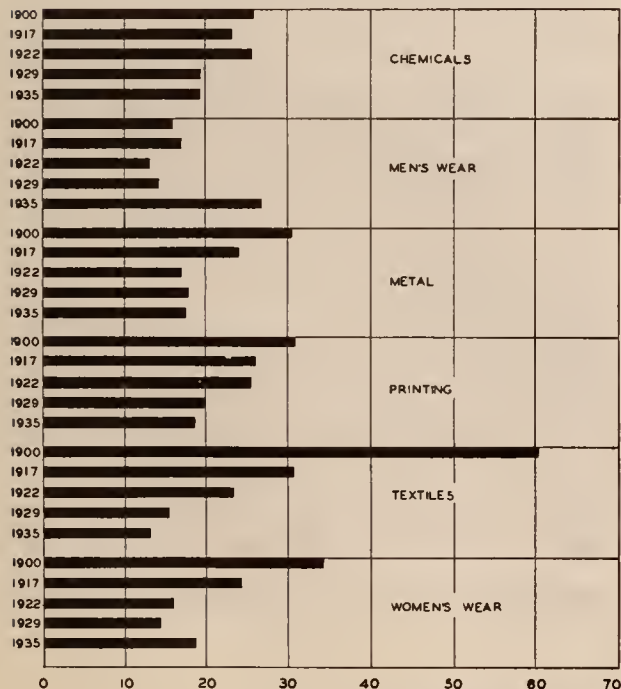


FIG. 10

MAYOR'S COMMITTEE ON CITY PLANNING
W.P.A. PROJECT NO. 465-97-3-96
DECEMBER 1937

WOMEN'S WEAR COMPARISON OF DISTRICTS BY PER CENT OF TOTAL EMPLOYEES

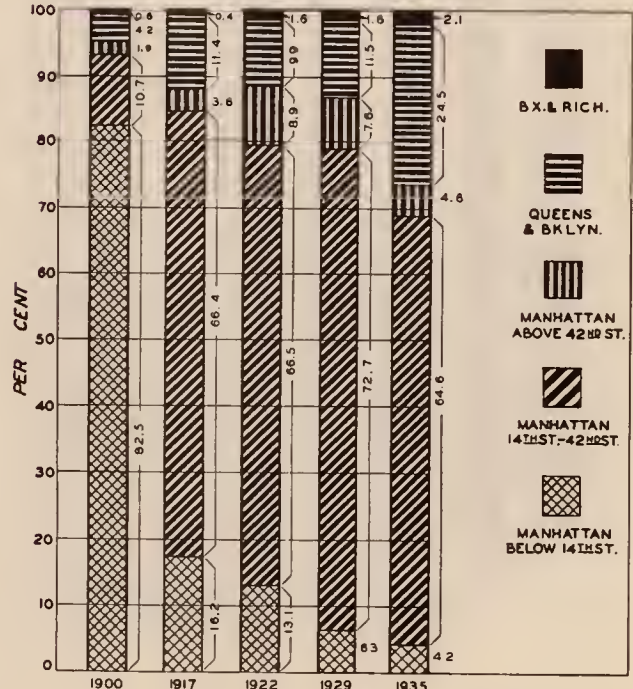


FIG. 11

MAYOR'S COMMITTEE ON CITY PLANNING
W.P.A. PROJECT NO. 465-97-3-96
DECEMBER 1937.

MENS WEAR INDUSTRY
COMPARISON OF DISTRICTS BY PER CENT
OF TOTAL EMPLOYEES

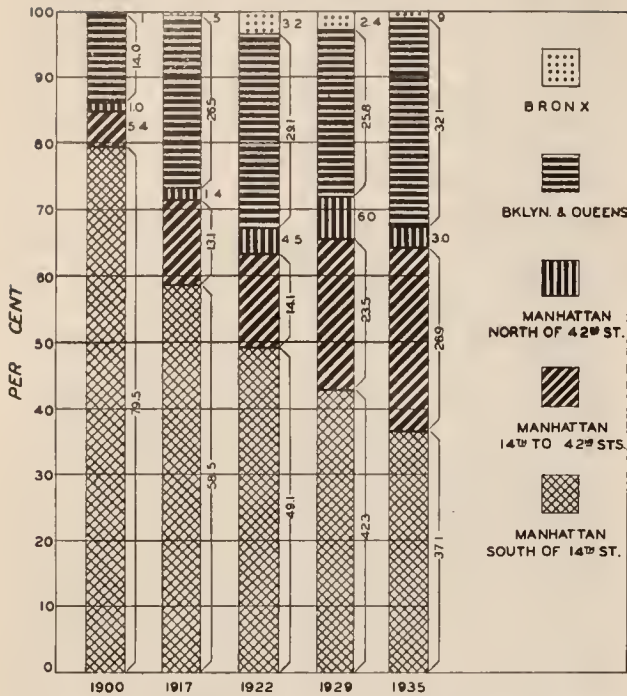


FIG. 12

MAYOR'S COMMITTEE ON CITY PLANNING
WPA PROJECT NO 465-97-3-96
DECEMBER 1937

MENS CLOTHING INDUSTRY
COMPARISON OF DISTRICTS BY PER CENT
OF TOTAL EMPLOYEES

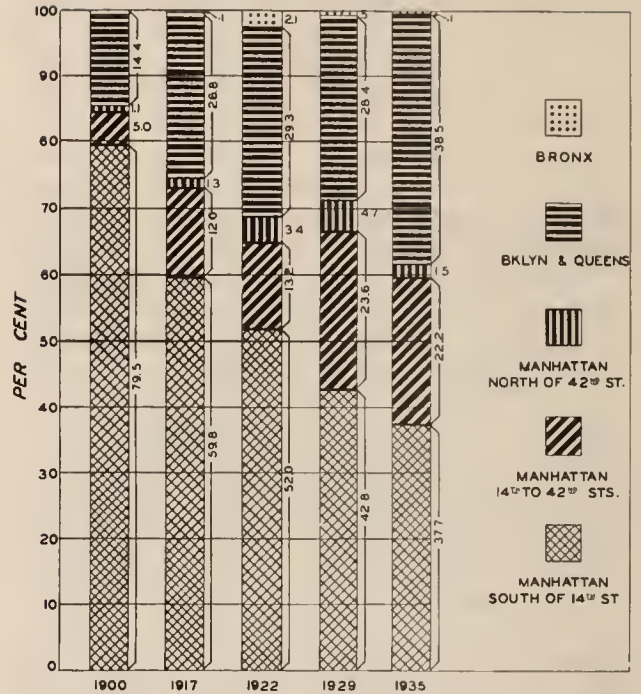


FIG. 13

MAYOR'S COMMITTEE ON CITY PLANNING
WPA PROJECT NO 465-97-3-96
DECEMBER 1937

MENS FURNISHINGS
COMPARISON OF DISTRICTS BY PER CENT
OF TOTAL EMPLOYEES

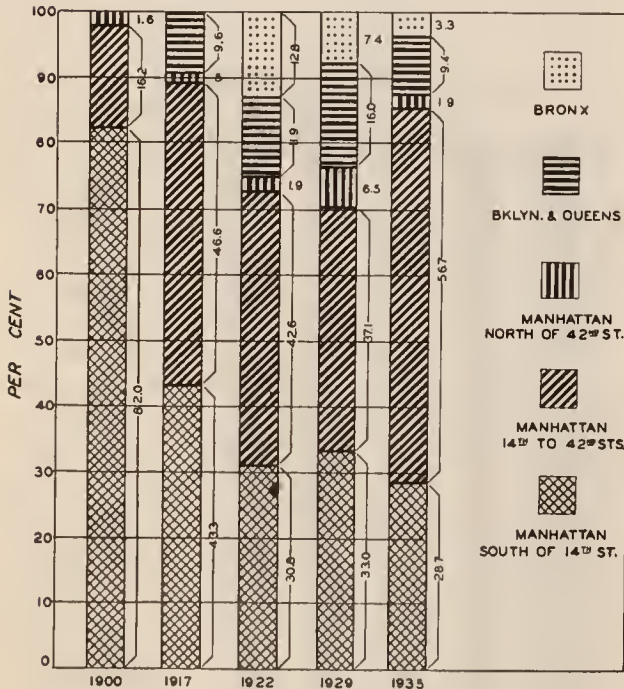
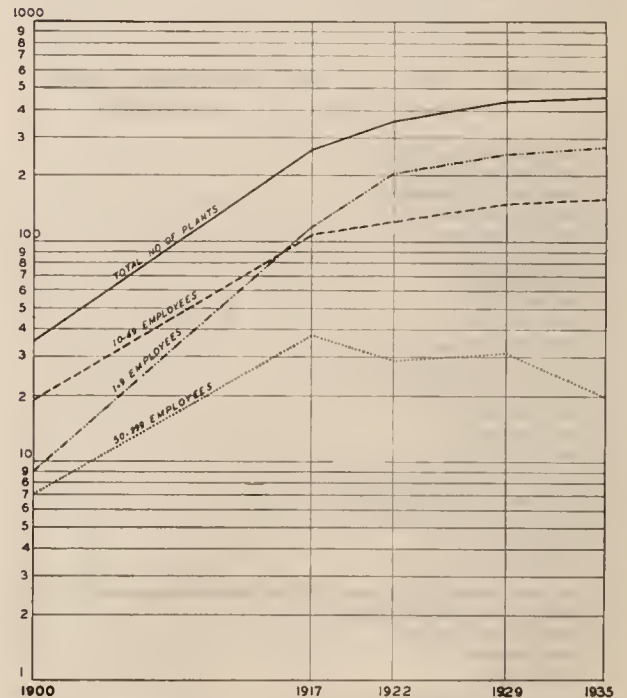


FIG. 14

MAYOR'S COMMITTEE ON CITY PLANNING
WPA PROJECT NO 465-97-3-96
DECEMBER 1937

MENS FURNISHINGS
NUMBER OF ESTABLISHMENTS BY SIZE OF PLANTS



DECEMBER 1937

FIG. 15

TO PREPARE A MASTER PLAN
WPA PROJECT NO 465-973-96

This jobber-contractor relationship creates unpredictable factors in the industry. Again quoting from the 1923 report: "The real problem relates to the future locations of the fabricating plants, now operated under the contractor system. There has been an impressive growth in the number of such plants outside of the portion of Manhattan south of 59th Street, a growth sufficiently substantial to give some ground for the belief that, with radical changes in the transportation system, a large part of the fabrication might be moved away from the center of the city. But the manufacture of women's cloaks and dresses, with its small space demands per worker, with its ability to utilize the space offered by the obsolete building, with the advantages accruing from the close contact with the salesrooms, will probably be among the very last of the factories to yield in the competitive struggle for sites in the center of the metropolis. This expectation may, however, be disturbed by future modifications in the jobber-contractor form of organization".⁽⁷⁾

Women's Garment Industry

Of the three industries—textiles, men's wear and women's garments—the last is the most important. Today about 75 percent of the women's clothing of the country is made in New York City. Over three-fourths of the workers are in the cloak and suit and dress and waist branches, with the latter growing more rapidly than the former.

The industry is highly concentrated in the center of the city, with more than three-fourths of the employees working in Manhattan south of 59th Street. In explaining this location of the industry a number of factors must be borne in mind.

1. The dependence, already mentioned, on immigrant labor which in the early days concentrated to a considerable extent on the lower East Side. Formerly the shops were very near to the homes of the workers.

2. Access to buyers afforded by an uptown location near the great passenger terminals and the hotels.

3. The seasonal character of the work which practically demands a central location where, due to the radial system of transportation, the labor force can be expanded or contracted with a minimum of effort.

Outside of the cloak and dress branches of the industry, fashion does not to so great a degree

control the situation. On the whole the demand is more stable and predictable, the product and processes are more susceptible of standardization, and the plan of organization need not sacrifice so much to secure elasticity. Underwear, children's wear, shirtwaists, kimonos, corsets and housedresses are usually manufactured in establishments organized on a larger scale and on a more permanent basis. Close contact with the salesroom and, therefore, with the center is less essential, and there is a much stronger tendency to scatter. Some of the lines can be standardized sufficiently to render them suitable for use as activities to supplement the man-using industries in such regions as the Pennsylvania coal fields.

The conclusions of the 1923 study of the garment industries are summarized in the following quotation: "Positive advantages of substantial importance must develop to attract from the center of the city those branches of the women's clothing industry in which the style factor is of great importance. In any case the salesrooms may be expected to remain in approximately their present location. Fabrication in the branches where style is of less influence may be expected to offer less resistance to a policy of decentralization, particularly if the transit plans are so arranged as to encourage the movement".⁽⁷⁾

It has been impossible to make a detailed study of conditions in this industry at the present time. Such a study should be made. However, from the analysis of statistics summarized for the Mayor's Committee, certain trends in the industry are discernible.⁽⁸⁾

Summary of Findings. Women's garments is still New York's leading industry. It is growing more steadily than other industries, but more slowly than formerly. Figure 8. The industry is moving from below 14th Street nearer to 42nd

(8) These figures are based on the State Factory Inspection records which were the basis of the former study. Since lack of time prevented an exhaustive study of the subject, it was decided to analyze the trends in all the industries studied primarily on the basis of numbers of employees rather than numbers of plants, as the factor of size would have to be taken into account in making comparisons based on plants. It was recognized, however, that technical changes, rather than a decline in the industry, might account for any decrease in the number of employees. Where the two indices showed similar trends, it was thought that they might serve as a fairly accurate index of what was happening in the industry.

United States Census of Manufactures figures were also consulted. The figures for women's wear give a more detailed trend line than does the summary of the State Factory Inspection records. The Census of Manufactures figures show a greater growth in the women's wear industry in New York City from 1929 to 1935 than do the State Factory Inspection records. The Census figures are not entirely comparable to the figures from the State Factory Inspection records, for in the former only plants with an annual product of \$5,000 or more are included, while in the latter the basis is plants employing one or more persons at manufacturing. There is also a difference as to the branches of the industry classified as "women's wear".

(7) Regional Survey of New York and Its Environs, Vol. I, page 87.

Street. But it is not growing as rapidly as it was formerly in the section between 14th and 42nd Streets. Brooklyn and Queens are the boroughs in which the growth is most rapid, particularly in Bay Ridge and the Broadway-Myrtle Avenue section of Brooklyn. Figure 11.

Dresses and waists is still the most important branch and shows the most steady growth of any of the branches. House dresses and kimonos have declined in importance since 1917. This is to be expected, since these branches are less influenced by style than are dresses and waists. Underwear has likewise declined, particularly since 1929. The neckwear industry shows an erratic course, which is probably due to changes in fashions in women's clothes.

Since 1929 there has been a decrease in the number of plants and an increase in the number of employees. This may mean decrease in the number of small contractors, or the development of the factory system. If so, it is important, and might be investigated further.

In general these observations check with predictions of the former study. The growing importance of the industry in the city, particularly in the 42nd Street district, and the decline of the more staple branches, was forecast in 1923. The question of the size of plant was raised in the earlier study, and listed as an unpredictable factor.

Men's Wear

New York has been the leading center for the production of men's wear for many years. The most important branch of the industry is the manufacture of men's clothing (men's and boys' suits and overcoats) which employs over half of all the workers in the industry in New York. About 40 percent of the value of the product for the whole country is produced here, and about 25 percent of all the men's clothing workers are in New York. Other branches of the industry include the making of shirts, hats and caps, and miscellaneous furnishings.

Men's wear has shown a stronger tendency to move to the outer areas than has the women's garment industry. The following brief summary gives a picture of the status and trends in the industry as a whole in New York City in 1935, judging by the number of employees and the number of plants.

Summary

The men's wear industry has been declining in New York City since 1917. Its importance relative to the other industries studied is much less

than it was formerly. Figure 8. The decline in the industry came earlier than in most industries.

Over 60 percent of the workers in the men's wear industry are employed in Manhattan, and this borough is maintaining its importance relative to other sections of the city. However, Manhattan south of 14th Street is declining in relative importance, while the section between 14th and 42nd Streets is increasing in importance. About one-third of the workers are in Brooklyn and Queens. Figure 12.

Why is this industry declining, and is this trend likely to continue? A detailed study of the various branches and of conditions of the industry elsewhere in the country would be needed if we were to have a full answer to the question. Such a detailed study remains to be made.⁽⁹⁾ However, the following analysis of the various branches throws some light on the subject.

Men's Clothing

New York is the spot market in the men's clothing industry and it is in meeting this uncertain, violently fluctuating, portion of the demand that the New York market has found the contractor form of organization so convenient. The contractor system and the high degree of seasonal variation are substantially similar to these features in the women's clothing industry. At the time of the 1923 survey it was expected that the selling offices of the men's clothing industry would remain in the center of the city, but that they would not require such choice sites as the salesrooms in the women's garment industry, for in the production of men's clothing it is not so necessary to be convenient to buyers. The forecast at that time was that the contractor, housed largely in obsolete buildings on the lower East Side and in Brooklyn, would continue to move outward.

Summary of Findings. The findings of the 1937 analysis for the men's clothing industry may be briefly stated as follows: The industry has shown a steady decline since 1917, but the rate of decline is decreasing. The rate of decline was more rapid than in other branches, but is now less rapid. There are about as many employees in the industry here as there were in 1900. About 60 percent of the men's clothing workers in New York City are on Manhattan Island. Other branches have a much larger proportion of their workers in Manhattan. However, the percentage of the workers

(9) The New York State Planning Council has subsequently undertaken such comparative studies for the State and other "competing" areas.

who are employed south of 14th Street is much greater than in most of the other branches. Brooklyn and Queens are also more important centers for the production of men's clothing than they are of other branches of the industry. Although Manhattan is still the most important section, the industry is moving from below 14th Street north in Manhattan and into Brooklyn and Queens. Figures 12, 13 and 14. The large plants are the only ones that have been growing since 1929. Small and medium sized plants have been declining rapidly since 1922 and since that time the small plants represent a smaller percentage of the total number of plants.

From these facts certain trends can be noticed and some puzzling questions arise. It is significant that this branch has a lower percentage of its workers in Manhattan than have the other branches. This may be due to the fact that, as in the case of women's clothing, large plants are becoming increasingly important in the industry. This increase in the size of plants may mean a decline of the jobber-contractor form of relationship, and the development of the factory system. The need of the contractor to be near the jobber has in the past been an important factor in keeping the industry in Manhattan. If factories are replacing the old system, this change in the organization of the industry may explain the decline in the manufacture of men's clothing in Manhattan, and may be the cause of a movement toward areas where cheaper land is available. The increasing importance of Brooklyn and Queens would indicate this. Figure 7.

The movement from below 14th Street may prove that some establishments in obsolete buildings have been driven out due to building programs in the downtown area. There may be a need on the part of some firms for closer contact with the hotels and terminals of the Times Square District. It is significant to note that although the industry has shown a steady decline since 1917, the rate of decline from 1929 to 1935 was less rapid than from 1917 to 1929. Why is the rate of decline today less than it was prior to the peak of prosperity? We should know whether this latter decline was due largely to the depression and was, therefore, part of a nation-wide decline in the industry. How much of a recovery has there been from 1933 to 1935? A thorough analysis of the Census of Manufactures, which was beyond the scope of this study, is needed to answer this question.

Regarding minor branches of the industry, it was predicted in 1923 that: "The minor branches

of the industry, producing shirts, trousers and similar articles, where the demand is more stable and the production capable of standardization will, like similar branches in the women's garment industry, continue to fill industrial chinks in communities in the environs or even beyond the environs".⁽¹⁰⁾

Of these minor branches, *hats and caps* showed a most noticeable decline, having reached a peak in 1917 and fallen steadily since. *Shirts* also reached a peak in 1917, but in 1935 the industry showed a better record than in 1929. There was a decline since 1922 in the importance of the manufacture of shirts relative to the other branches. *Men's furnishings* were fairly stable in actual importance and were increasing in relative importance. The number of plants was growing. A brief summary of conditions in these branches of the industry in 1935 follows.

Men's Furnishings

This branch ranks next to clothing in importance. The number of employees has been fairly stable from 1917 to 1935 and is considerably above the number in 1900. The number of plants has been steadily increasing. There is a greater percentage (87 percent) of the workers in this branch in Manhattan than any other branch, and Manhattan has been growing since 1922. The district bounded by 14th-42nd Streets showed a great increase in importance at the expense of every other district in the period from 1929 to 1935. Figures 12, 13 and 14. The percentage of the workers in Brooklyn and Queens is smaller than in any other branch except in the manufacture of shirts.

The large plants are the only ones that have been declining since 1917. The greatest growth has been in the small plants. Figure 15.

Hats and Caps

This branch is the least important now, but originally it was comparatively important. There has been a steady decline in the number of employees since 1917, and in both employees and plants since 1922. Since 1917 the number of employees has been far below the number in 1900. There is a greater percentage of the workers in Manhattan south of 14th Street than in any other branch. Brooklyn and Queens together are more important than any section of Manhattan except the district south of 14th Street. The number of plants of all sizes is decreasing.

(10) Regional Survey of New York and Its Environs, Vol. I, page 94.

Men's Shirts

This branch is one of the least important in the industry. There is a smaller percentage of the workers in Manhattan south of 14th Street than in any other branch. The industry in Manhattan is moving from the district south of 14th Street north toward 42nd Street. In recent years the number of plants of all sizes has been increasing.

Summary

Summarizing our findings for the men's wear industry as a whole, stress should be laid on the decline in its importance both in the number of employees and of plants and in importance relative to other industries. It is also important to note that Manhattan continues to house over 50 percent of the industry.

The Textile Industry

At the time of the 1923 study the textile industry showed normal growth, but an analysis of its various branches seemed to indicate the possibility of a decline in the industry. A brief summary of this analysis is pertinent at this time.

Knit Goods

The knit goods branch was expected to move from the center of the area after it had passed the "nursery" stage of development and was, therefore, no longer dependent on proximity to the market center, near to a rich and varied labor supply and to technical skill. Time has apparently justified this expectation for the knit goods industry is definitely declining in importance. Figures 16 and 18. It is interesting to note that from 1922 to 1929 the industry declined 50 percent in relative importance, but from 1929 to 1935 the decline in relative importance was negligible. The decrease in the number of employees was noticeable in all sections of the city, although to varying degrees. Brooklyn, and Upper Manhattan and The Bronx, showed the greatest decrease, while Queens, and Manhattan below 59th Street, showed the least decline. Figures 17 and 18. This slight decline in importance in Manhattan below 59th Street would seem to indicate the continued importance of accessibility in certain branches of the industry. It would be interesting to ascertain if specific branches of the knit goods industry have concentrated in Manhattan south of 59th Street. If there is a concentration of certain branches, is it those branches where style is an important factor, or are they still in the "nursery" stage?

Silk Goods

From 1900 to 1922 the silk goods industry showed a relatively slow rate of growth in New York, with a trend in favor of such districts as eastern Pennsylvania. This movement to locations outside of the metropolitan area was attributed to the fact that the manufacture of silk is supplementary to such man-using industries as the manufacture of metal products. Therefore, its future is not easy to predict.

In 1935 there was a decline in the industry compared with 1922, both in relative and in actual importance. However, the rate of decline in actual importance from 1929 to 1935 was less sharp than from 1922 to 1929. Figure 16. It is important to note that the section where the industry retained the strongest hold was lower Manhattan. Figure 19. This may be an instance of the importance of accessibility.

Finishing Branch

The finishing branch is growing in New York City. In 1900 this branch employed 8.2 percent of the employees in the industry in New York City, while in 1935 it employed 12.9 percent of the employees. Figure 16. In the general decline in the textile industry from 1929 to 1935 this branch showed the lowest rate of decline. This may be because the branch of the finishing trades engaged in cloth sponging, examining and shrinking is really a function of the clothing trades and will, therefore, naturally persist beside them. The boroughs in which the rate of growth of the finishing branch seems to have been most rapid are, first, Queens, and second, Brooklyn. Richmond has faded out of the picture entirely. What have Brooklyn and Queens to offer which Richmond has not? Is it, perhaps, better transportation to the market? Compared with Manhattan and The Bronx it may be assumed that the space available on Long Island may favor this section rather than The Bronx or Manhattan Island, where space is at a premium.

Small Wares

The small wares branch of the industry, consisting of production of bindings, braids, trimmings, passementeries, laces, labels, et cetera, is subject in a great degree to changes in fashion. In fact, it is really a service industry to the manufacturers of clothing, and therefore subject to the same location factors that determine the location of that trade. At the time of the earlier studies

TEXTILE INDUSTRY PER CENT OF EMPLOYEES IN VARIOUS BRANCHES

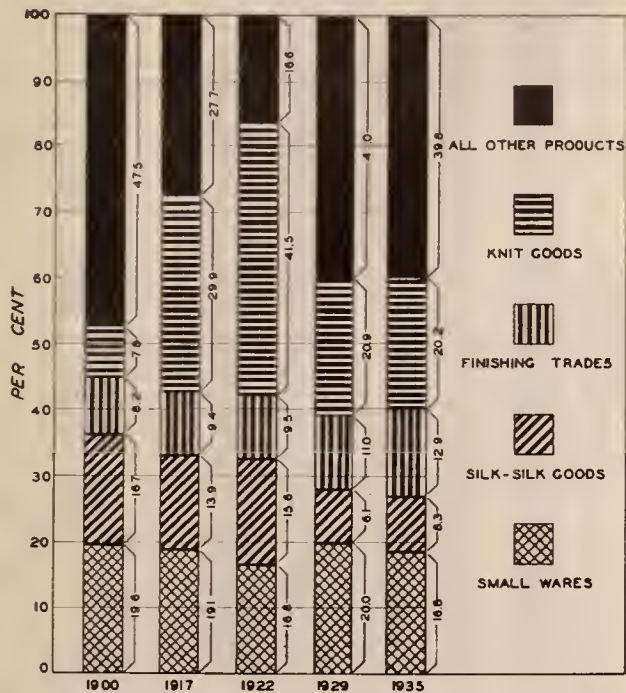


FIG. 16

MAYOR'S COMMITTEE ON CITY PLANNING
WPA PROJECT NO. 465-97-3-96
DECEMBER 1937

KNIT GOODS COMPARISON OF DISTRICTS BY PER CENT OF TOTAL EMPLOYEES

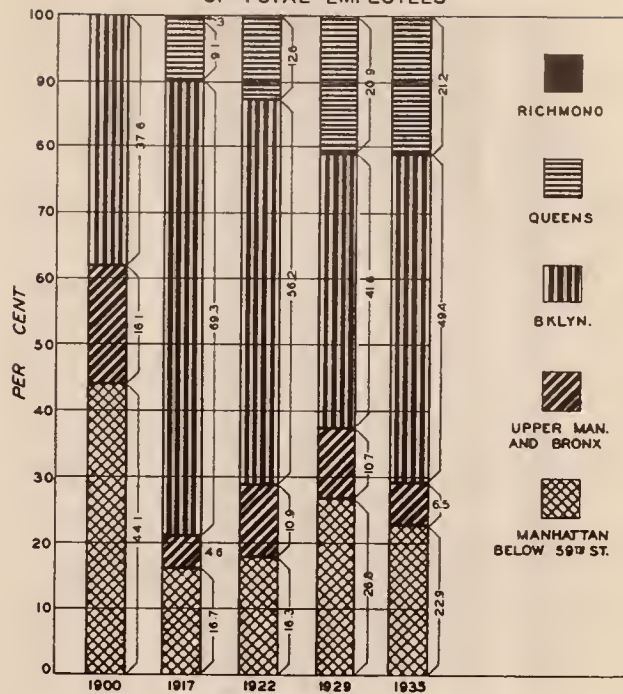


FIG. 17

MAYOR'S COMMITTEE ON CITY PLANNING
WPA PROJECT NO. 465-97-3-96
DECEMBER 1937

KNIT GOODS COMPARISON OF DISTRICTS BY NO. OF EMPLOYEES

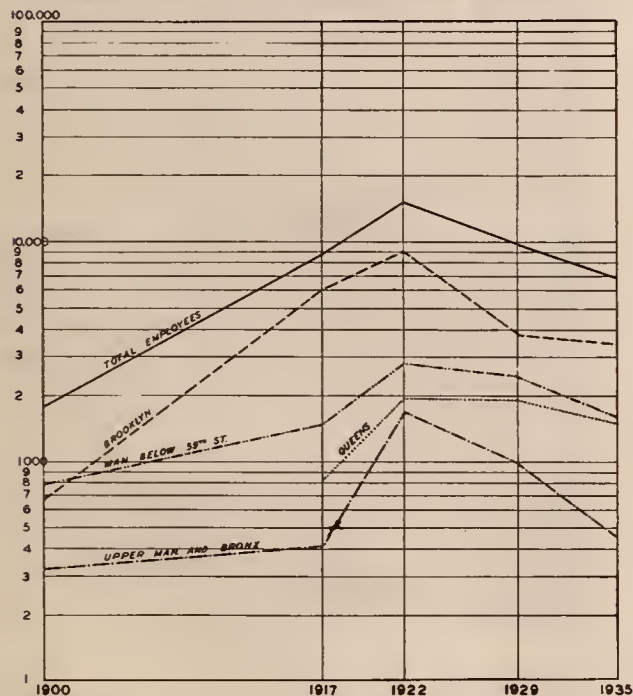


FIG. 18

DECEMBER 1937

TO PREPARE A MASTER PLAN
WPA PROJECT NO. 465-97-3-96

SILK & SILK GOODS COMPARISON OF DISTRICTS BY PER CENT OF TOTAL EMPLOYEES

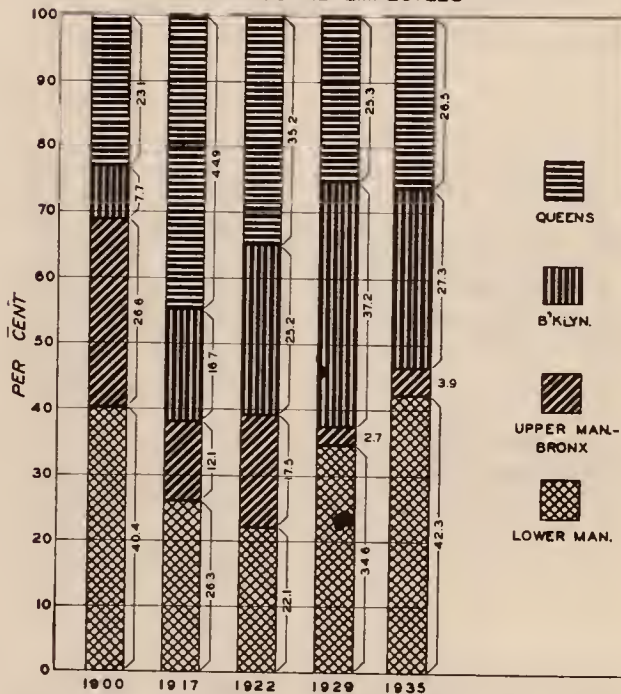


FIG. 19

MAYOR'S COMMITTEE ON CITY PLANNING
WPA PROJECT NO. 465-97-3-96
DECEMBER 1937

TEXTILE & SMALL WARES INDUSTRIES COMPARISON OF DISTRICTS BY PER CENT OF TOTAL EMPLOYEES

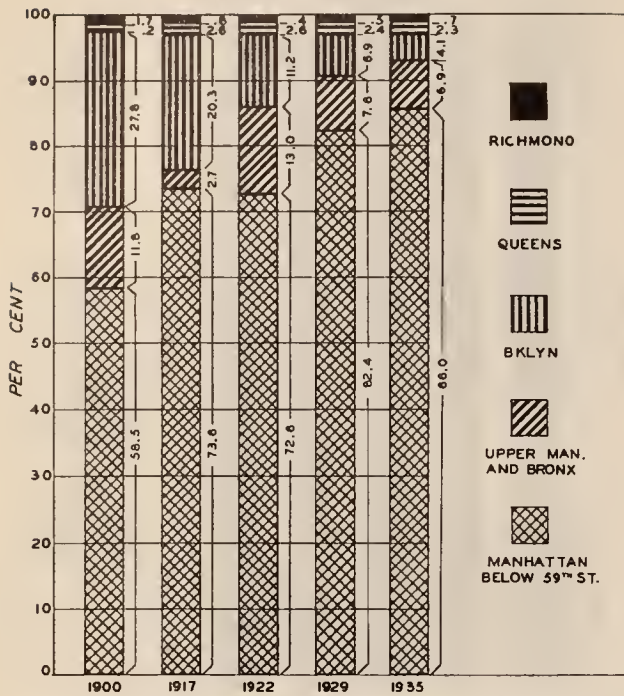


FIG. 20

MAYOR'S COMMITTEE ON CITY PLANNING
WPA PROJECT NO. 465-97-3-96
DECEMBER 1937

PRINTING COMPARISON OF DISTRICTS BY PER CENT OF TOTAL EMPLOYEES

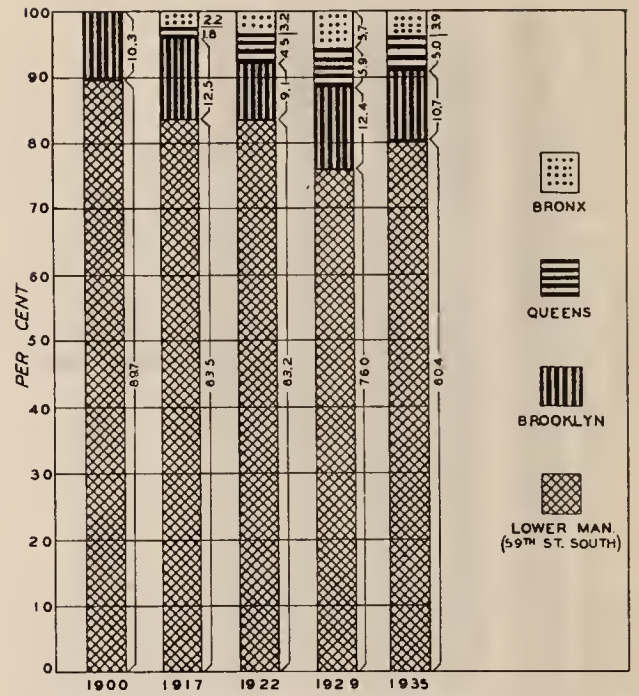
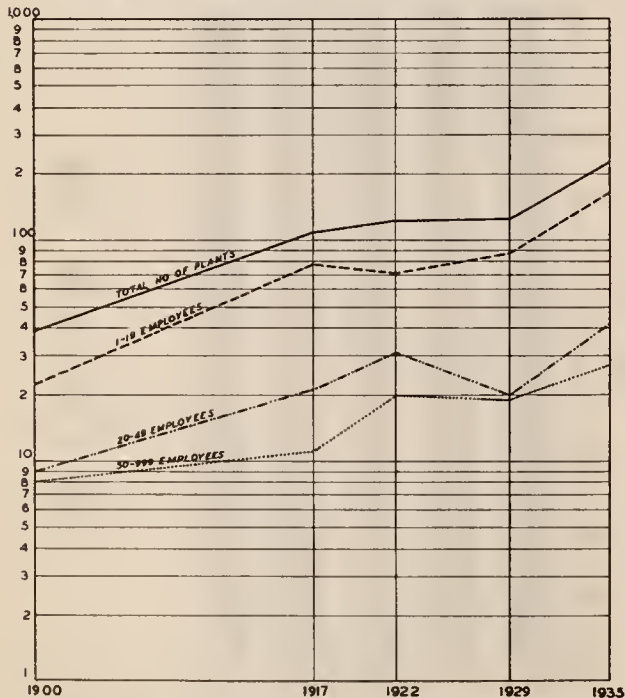


FIG. 21

MAYOR'S COMMITTEE ON CITY PLANNING
WPA PROJECT NO. 465-97-3-96
DECEMBER 1937

SLAUGHTERING, MEAT & FISH PACKING NUMBER OF ESTABLISHMENTS BY SIZE OF PLANTS

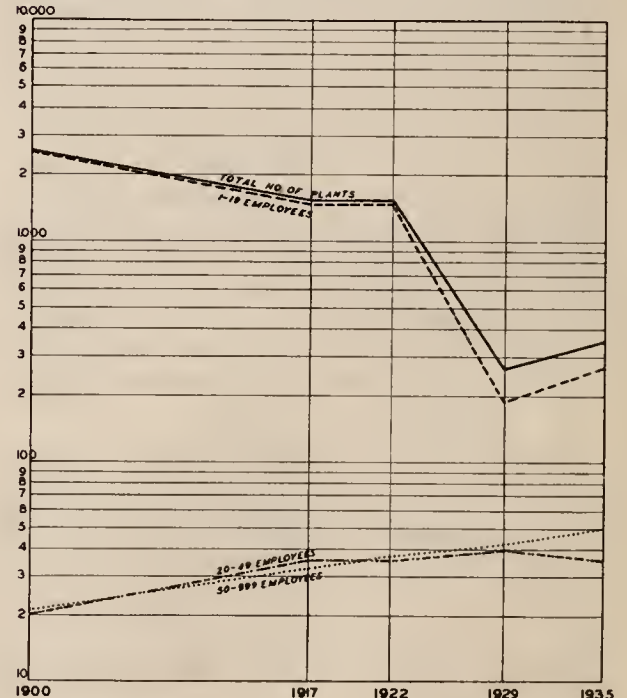


DECEMBER, 1937

FIG. 22

TO PREPARE A MASTER PLAN
WPA PROJECT NO. 465-97-3-96

BAKERIES NUMBER OF ESTABLISHMENTS BY SIZE OF PLANTS



DECEMBER 1937

FIG. 23

TO PREPARE A MASTER PLAN
WPA PROJECT NO. 465-97-3-96

nearly one-half of the workers were employed in Manhattan south of 59th Street. Since 1900 this branch has been fairly stable in relation to the other branches of the industry (Figure 16) and has shown a rather steady growth. Its rate of growth is comparable to that of the women's garment industry. Manhattan south of 59th Street continues to attract the largest share of the industry and had maintained a fairly steady rate of growth. Figure 20.

Summary

Summarizing for the textile industry as a whole, it has shown a steady rate of growth from 1900 to 1929 and a very slight decrease from 1929 to 1935. This decline, however, is very likely due to the depression. As no tabulation of State Factory Inspection figures is available for 1933, Census of Manufactures figures should be consulted. ⁽¹¹⁾

The Printing Industry

In 1923 it was found that in the printing industry newspapers occupied the most expensive sites, the evening papers being located downtown, while the morning papers exhibited a trend uptown to the neighborhood of the railroad terminals. This trend was expected to continue. Analysis of the 1935 figures shows that practically all of the printing of this type which is done in New York City is located in Manhattan.

Small job printers seek proximity to their customers. The people they serve are usually anxious to save time and inconvenience, and therefore patronize the more accessible printers. It was considered likely in 1923 that this type of printing would remain on land just removed from the most desirable business locations. On the other hand, the large job printer specializing in standard forms is not particularly interested in a convenient location. This is true of book and periodical printing, except where the element of time is of great importance. Lithography and book-binding were among the branches occupying the cheaper land. It was expected that they would continue. Unfortunately, statistics for these branches could not be analyzed at the time this report was prepared. A summary of the available statistics on the number of employees and plants in the printing industry follows:

⁽¹¹⁾ See Footnote 8 for an explanation of the differences between these two sets of figures.

Summary

The industry is one of the most important of the nine studied. Except for a slight decline from 1922-1929 there has been a slow, but steady, growth since 1900. About 80 percent of the workers in plants with 20 or more employees are working in lower Manhattan. This section has a smaller percentage of the workers than it had in 1900, but from 1917 on, lower Manhattan's share of the industry has remained fairly stable. Brooklyn has about 10 percent of the employees in the industry. The other boroughs are of negligible importance. Figure 21. The rate of growth of the industry in lower Manhattan has been slow, with an actual decline from 1922 to 1929. The rate of increase in other sections was quite rapid from 1900 to 1917. Queens and The Bronx were growing at the most rapid rate until 1929, when there was a decline due possibly to the depression. During this period, however, Manhattan showed an increase.

It is impossible to draw many conclusions for the industry as a whole, but it is evident that the need for accessibility keeps certain branches in the center of the city.

The Food Industry

As might be expected, the rate of growth of the food industries has coincided closely with the rate of growth of population. The diverse branches of the industry have little in common and have, therefore, been considered separately.

Baked Goods

Bakery products are perishable and undergo considerable expansion in bulk during the process of manufacture. In the case of bread, these elements in the problem are apparently controlling, and indicate the probability of bread bakeries growing with the population. The manufacture of crackers is an industry which employs more men than women and its labor requirements fluctuate widely from season to season. Accessibility to a large labor pool is therefore necessary, consequently a location near the center of the metropolitan area is desirable. Large candy factories requiring a great deal of hand work in production and packing also seem to find a central location most suitable for their needs.

Sugar Refining

In 1923 it was thought that sugar refining would continue to be an important industry in New York

because the cheapest arrangement for refining imported sugar is to bring the sugar to a point where, on its way to market, it meets the coal. This it does in New York City. However, the problem of the tariff enters here. Quoting from the previous report: "The future of sugar refining in the neighborhood of New York may be adversely affected by an expansion of beet-sugar growing, for the modern beet-sugar factory produces refined sugar near the point where the beets are grown. Tariff policy will be of great importance in determination of the issue, and any prediction would be hazardous". (12)

Meat

Slaughtering and meat packing are only of local significance. In the case of pork, this is due to the prejudice of the New York consumer against pork which has been chilled and shipped. The religious rules of the Jewish population requiring that meat be eaten within seventy-two hours after the animal has been killed account for the local slaughtering of beef, veal and lamb. The falling off in Jewish immigration and the decline in the observance of orthodox customs had already at the time of the survey brought about a 25 percent to 50 percent reduction in the consumption of kosher meat during the previous ten years. In 1923 abattoirs in Manhattan were found close to the choicest hotel and residential districts. Such localization of the industry would seem to be a misuse of valuable sites. However, the suggestion has been made that improvements in means of transportation throughout the area might cause a shift in the location of the slaughtering industry.

Other Food Industries

Other food manufacturing industries include the processing of imported foodstuffs such as coffee, tea, cocoa and chocolate. Brooklyn has a large share of these plants, access to the warehouses along the waterfront being the main attraction. While the number of workers engaged in the manufacture of beverages in 1923 decreased, due in part to prohibition, the number employed in the manufacture of dairy products increased.

Summary

Relatively few statistics in summary form are available on the food industries at this time. However, food production is moderately important com-

pared with other industries, and has been fairly stable from 1929 to 1935. The trend in the number of plants has been erratic. There was a decline from 1900 to 1917, a rise from 1917 to 1922, a sharp decline from 1922 to 1929 with a rise from 1929 to 1935. The general trend has been downward, but the large plants have not declined as much as have the small plants. The decline in the number of plants may not therefore be significant.

Baked goods continues to be the most important branch, with about one-fourth of the total number of food workers. But the relative importance of this branch was much less in 1935 than in 1929, being 23.8 percent compared with 30.7 percent. Confectionery ranked next, with about one-fifth of the workers. Meat, beverages and refined sugar lagged far behind, with about 6.5 percent of the workers in each of these branches. Of these, refined sugar was the only branch which showed any appreciable change in relative importance. Since 1929 there was an increase from 2.5 percent in 1929 to 6.3 percent in 1935.

These statistics, inadequate as they are, would seem to indicate that the element of perishability and the need for varying supplies of labor continue to keep many bakeries in the city, although this may not be quite as true as it was formerly. The need for further study of this and other branches of the industry is quite evident.

In the three branches for which we have statistics on the number of plants, the following trends are interesting. Slaughtering is the only branch for which there has been a steady increase since 1900. The greatest rate of increase was in the small plants. Figure 22. Confectionery showed the most rapid rate of increase from 1900 to 1922, but a rapid rate of decrease from 1922 to 1929 with a slight decrease thereafter. The small plants showed the greatest amount of change. Bakeries declined rapidly from 1900 to 1929 with an increase after that. There was a considerable decrease in the number of small plants from 1900 to 1929 with an increase in 1935, while the number of large plants rose steadily during the period. Figure 23. For the food industry as a whole we may say that it is maintaining itself. Bakeries continue to be the most important branch, but they are declining in relative and actual importance. Further than that the data at hand do not permit more specific conclusions regarding trends in the industry.

Metal Products

During the period covered by the Regional Plan Survey, the dominant part of the metal industry shifted from the heavy to the light branches. In

(12) Regional Survey of New York and Its Environs, Vol. I, page 67.

the latter part of the period there was a decline in all sections of the New York Region except in Queens and in New Jersey. This decline has continued since 1922. Nuisance features and problems of waste disposal were factors in driving factories off of Manhattan Island. For somewhat similar reasons copper refining was also expected to decline. The most rapidly growing branch of the industry was that producing technical instruments, supplies and fixtures. This branch continued to rise to 1929 and then fell off slightly to 1935. In many cases the advantages of the metropolis during the early experimental stages were considered to be influential. No great changes in the location of this group were foreseen. The largest absolute growth occurred in the branch of light metal products, repairing, and work of a service nature. This branch rose until 1922 then declined sharply to 1929. It showed a rise from 1929 to 1935. The cause of this decline from 1922 to 1929 is not immediately evident.

The jewelry branch showed a slight gain in 1923 and continued to grow until 1929, after which it evidently suffered from the decline in prosperity. A movement uptown by manufacturers of expensive jewelry was noticed. Since 1922 this trend for the branch as a whole has been quite noticeable. Figure 24. This was attributed to the need of manufacturers to be in close contact with their customers. At the time of the earlier survey, the branches of a service nature were expected to continue in locations convenient to their customers. Although 50 percent of the employees of this branch are still employed in Manhattan, this borough is declining somewhat in relative importance. The small scale specialized type of production catering to the local market was expected to be localized largely in Brooklyn and Queens.

At the time of the first survey it was held likely that for the metal industry as a whole Brooklyn and Queens would decline, unless there were great changes in transportation facilities. From 1922 to 1935 Queens declined about 2 percent in relative importance, but Brooklyn continued to have about 33 percent of the workers in the industry. In fact, these two boroughs together are much more important relatively in the metal products industry than they are in most of the industries studied. The expectation for the industry in 1923 was that, except for the early stages of fabrication, where there were great reductions in bulk and weight, the industry would continue to flourish in New York and its environs. Since 1923, however, there has been a slow decline in the industry. There is

need for further analysis to determine the reason for this decline.

Summary of Findings. Prior to 1912 the metal products industry was the most important of the nine industries studied. Today it ranks second following women's wear. Figure 8. It has shown a steady but slow decline since 1922.

Brooklyn and lower Manhattan each had about one-third of the number of workers in the city. Each of these sections was more than twice as important as any of the remaining sections. Since 1922 each section of the city has maintained a fairly stable percentage of the total number of employees in the city's metal industry, but Richmond has increased its share from practically nothing in 1922 to 3.9 percent in 1935. The number of employees in upper Manhattan and The Bronx, Brooklyn and Queens declined from 1922 to 1929. During this period the proportion of the industry in lower Manhattan remained approximately stationary, while in Richmond it was increasing steadily from 1929 to 1935.

From 1922 to 1935 large plants have shown the most rapid decline. In all branches except technical instruments the average number of employees today is less than it was in 1900. In all cases, except in the production of light metals and in repairing, it is less than it was in 1917. For the industry as a whole, the average number of employees was slightly greater in 1929 and 1935 than in 1922.

Heavy Machinery

About one-third of the workers in the metal products industry are engaged in the production of heavy machinery. There has been a fairly steady decline in the number of workers since 1917. Brooklyn has nearly 50 percent of the workers in the industry; Queens has about 25 percent. This compares with 35.5 percent and 14.4 percent respectively for the industry as a whole. These conditions have prevailed for some time. There has been a steady decline in the number of workers in Brooklyn since 1917. The number of workers in Richmond has risen from practically nothing in 1922 to 7.6 percent in 1935. In upper Manhattan and The Bronx the number of employees rose from 1917 to 1929, then dropped, as it did in all of the other boroughs except Richmond, during the depression.

Jewelry and Precious Metals

Relative to other branches, this represents about one-tenth of the number of workers in the

industry. In 1935 there were fewer workers than at any time since 1900. Lower Manhattan has over 50 percent of the workers, but the proportion of workers has declined from about 75 percent in 1922. Upper Manhattan and The Bronx have grown in relative importance, and until 1929 quite rapidly in actual importance, from 17.2 percent in 1922 to 37 percent in 1935. Queens was also growing, from 0.3 percent in 1917 to 3.1 percent in 1935. There has been a considerable decline in the importance of Brooklyn since 1900. Figure 24.

Light Metals

A little less than one-third of the metal workers are engaged in the manufacture of light metals. This branch is much less important relatively than in 1922. There has been a sharp decline from 1922 to 1929, and a slight rise from 1929 to 1935. Brooklyn has the largest number of workers in the industry, and has grown steadily in relative importance (from 22.9 percent in 1900 to 36.3 percent in 1935). The number of workers in Richmond has risen from practically none in 1922 to 2.2 percent in 1935. In all boroughs except Richmond the number of employees declined from 1922 to 1929. It would be interesting to know the reason for the increased importance of Richmond. In 1935 all sections except lower Manhattan picked up. The failure of the industry to grow in lower Manhattan may be quite significant.

Technical Instruments

A little over one-fourth of the number of metal workers are in this branch. This branch is growing in importance relative to other branches. There has been a steady growth to 1929, then a slight decline to 1935. Brooklyn and lower Manhattan each have about one-third of the workers. Lower Manhattan, however, is declining in relative importance, while Brooklyn is increasing. In other sections this branch is far less important. Queens and Richmond have grown from practically nothing in 1900 to 14 percent and 3 percent respectively in 1935. Figure 25. Queens grew steadily to 1935, so did Brooklyn, except for the depression year in 1922. Lower Manhattan had the most noticeable decline from 1929 to 1935.

The Chemical Industry

When the survey was made in 1923, chemicals showed the most rapid rate of growth in New York and its environs of any of the nine indus-

tries studied. But expansion in other parts of the country was even greater. Although the Region as a whole was the largest single chemical center in the United States, the city itself was not as important as its environs, particularly New Jersey. While portions of the New York Region are particularly well suited to this industry, the following analysis shows why New York City is not well adapted to the production of chemicals.

The industry may be divided into the following groups: (1) Heavy chemicals, including acids, ammonia, sodas, potash, bleaching compounds, compressed and liquefied gases, and all chemicals where tonnage is large; (2) Fine chemicals, including alcohol and essential oils, pharmaceuticals, drugs and medicines, and photographic chemicals; (3) Soap and toilet preparations; (4) Petroleum products; (5) Paints and dyes; (6) Other chemicals, including animal and vegetable oils and greases, glue and fertilizers; (7) Explosives.

The following description of the peculiar needs of the industry is taken from the survey report of 1923. "Chemical plants often demand a large space . . . In some cases machinery is extensively used and moreover this machinery is often of a type which renders it desirable to use buildings of not more than one story. The processes often require a long period of time, three months or more in some cases. Finally it is often necessary to isolate certain processes. The necessity for large plots . . . raises special problems with regard to plottage, the conventional arrangement of city blocks often being entirely unsuited for the needs of the industry.

"Fire hazards are great in most branches and in many cases there are also objectional odors and fumes. . . .

"In many cases there is little handwork and the large amount of machinery and slow processes require a comparatively small amount of labor." (13)

The one branch of the industry which in 1923 showed a rapid growth was perfumes and cosmetics. The growth was mushroomlike, many of the companies not being firmly established. The indication was that when the industry became more stable many of the large plants would move out of Manhattan. This branch continued to grow in importance until 1929, and even during the depression there was only a slight decline in the

(13) Regional Survey of New York and Its Environs, Vol. IA, The Chemical Industry, page 12.

JEWELRY & PRECIOUS METALS
COMPARISON OF DISTRICTS BY PER CENT
OF TOTAL EMPLOYEES

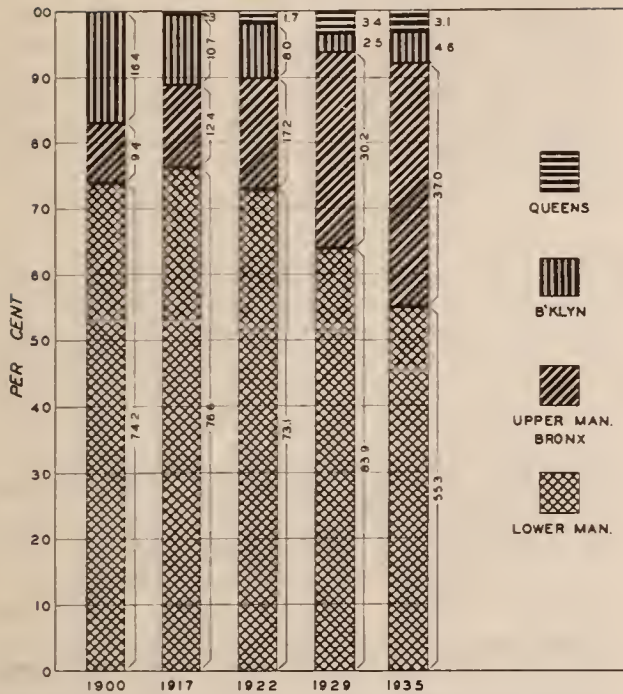


FIG. 24

MAYOR'S COMMITTEE ON CITY PLANNING
WPA PROJECT NO. 465-97-3-96
DECEMBER 1937

TECHNICAL INSTRUMENTS
COMPARISON OF DISTRICTS BY PER CENT
OF TOTAL EMPLOYEES

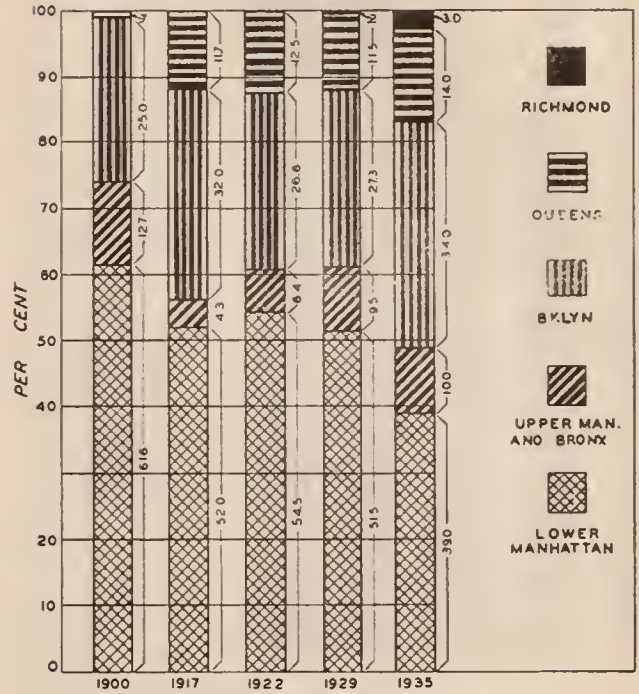


FIG. 25

MAYOR'S COMMITTEE ON CITY PLANNING
WPA PROJECT NO. 465-97-3-96
DECEMBER 1937

CHEMICALS
COMPARISON OF DISTRICTS BY PER CENT
OF TOTAL EMPLOYEES

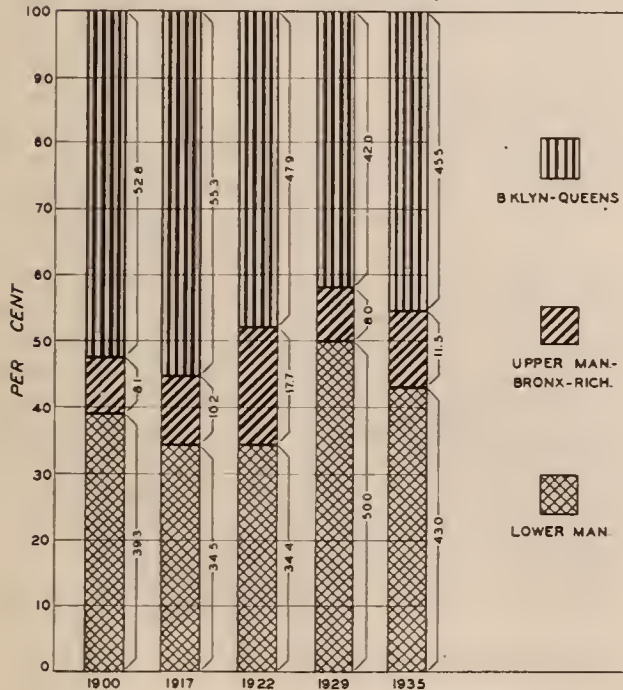


FIG. 26

MAYOR'S COMMITTEE ON CITY PLANNING
WPA PROJECT NO. 465-97-3-96
DECEMBER 1937

SOAP & TOILET PREPARATIONS
COMPARISON OF DISTRICTS BY PER CENT
OF TOTAL EMPLOYEES

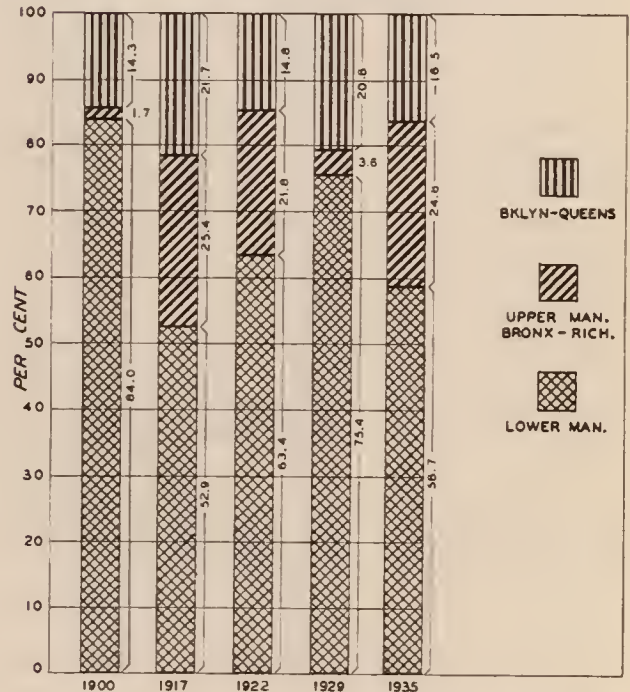


FIG. 27

MAYOR'S COMMITTEE ON CITY PLANNING
WPA PROJECT NO. 465-97-3-96
DECEMBER 1937

FINE CHEMICALS COMPARISON OF DISTRICTS BY PER CENT OF TOTAL EMPLOYEES

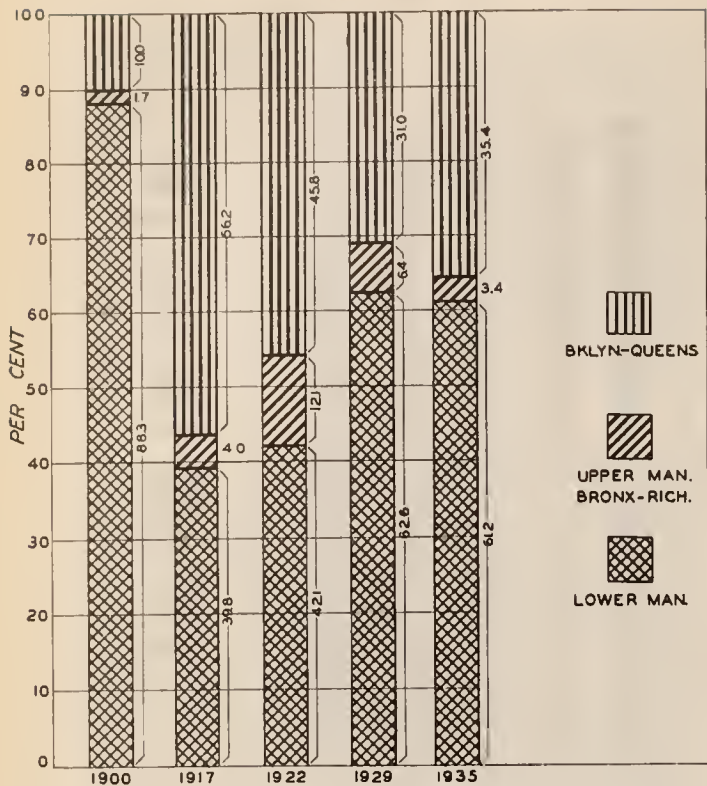
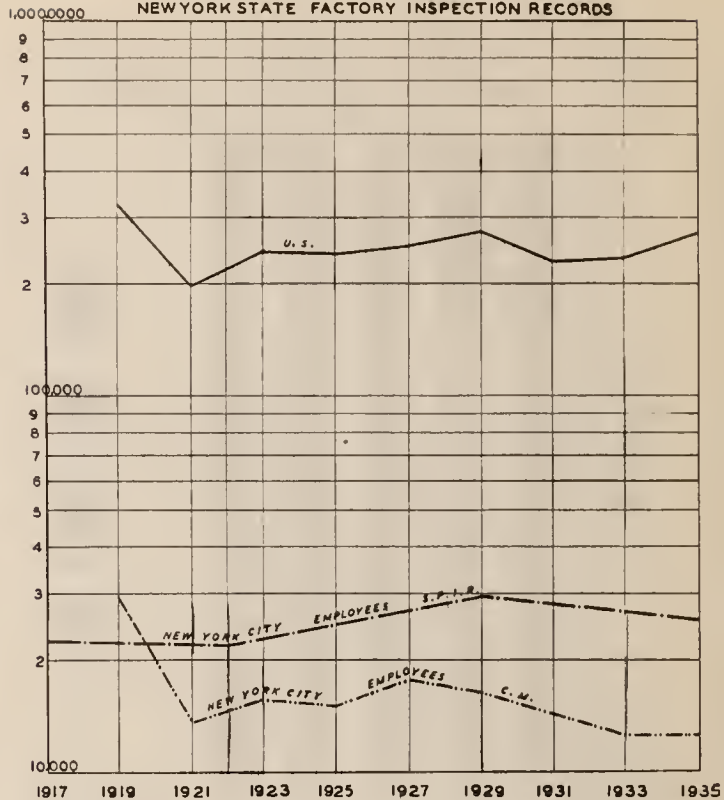


FIG. 28

MAYOR'S COMMITTEE ON CITY PLANNING
WPA PROJECT NO 465-97-3-96
DECEMBER 1937

EMPLOYEES IN THE CHEMICAL INDUSTRY

NEW YORK CITY COMPARED WITH U.S.
BASED ON U.S. CENSUS OF MANUFACTURES AND
NEW YORK STATE FACTORY INSPECTION RECORDS

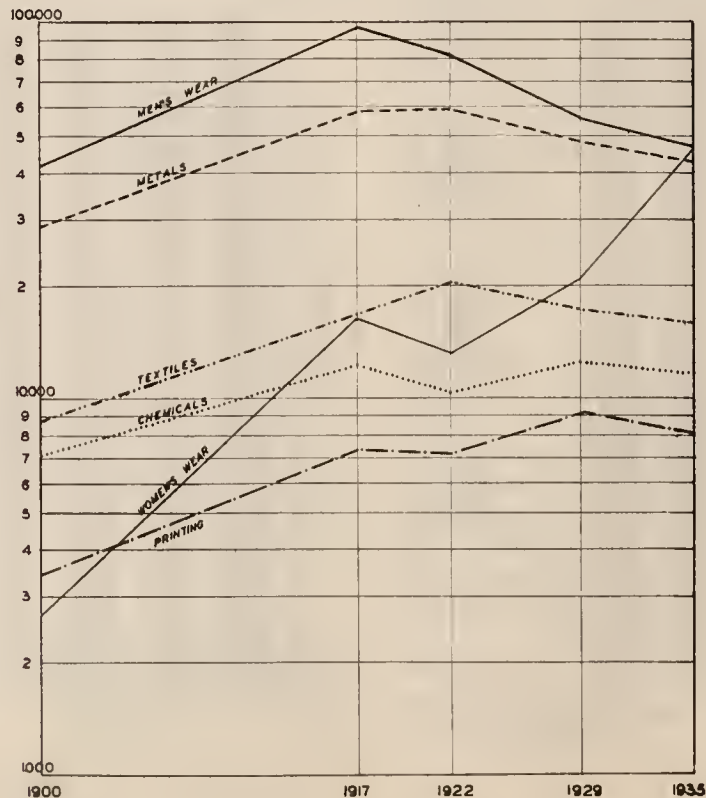


DECEMBER, 1937

FIG. 29

TO PREPARE A MASTER PLAN
W.R.A. PROJECT NO 465-97-3-96

NO. OF EMPLOYEES IN SIX INDUSTRIES IN B'KLYN AND QUEENS



DECEMBER 1937

FIG. 30

TO PREPARE A MASTER PLAN
WPA PROJECT NO 465-97-3-96

number of its employees. Since 1922 this branch has employed about one-fourth of the chemical workers in the city.

Fine chemicals also has about one-fourth of the workers. Regarding the situation in 1923 the report states that, "Brooklyn is a great center, particularly for pharmaceuticals. Many of the establishments are small concerns making highly specialized products by unstandardized methods with hand labor rather than machinery. Often the article is patented or is a semimonopoly. In such cases the profits of a successful concern are large and the firm is under slight pressure to reduce costs. The large plants find little to hold them in Manhattan. Brooklyn is more attractive, but the drift to New Jersey is discernible even in this group. A large plant which moves to New Jersey often retains an office in Manhattan." (14)

Regarding other branches of the industry in lower Manhattan there had been either an unimportant increase between 1900 and 1922 or an actual decrease. In most lines there seemed to be a distinct movement from the center of the area to the outlying regions. Upper Manhattan and The Bronx were unimportant in the manufacturing of chemicals, and there was little expectation of any large development. Staten Island was considered to have many advantages, but growth of the industry in this section was limited by the scarcity of labor and inadequacy of transportation facilities. Both of these difficulties were thought to be temporary, and it was expected that before many years growth would be comparable to the Jersey shore.

There had been a slow and steady growth of the chemical industries in Brooklyn and Queens between 1900 and 1917, but a decline after that. Most of the plants were along the waterfront, especially Newtown Creek. Regarding trends in this section the conclusion in 1923 was that:

"In general the higher land values, the necessity for controlling fumes and odors, the difficulty of disposing of waste and the scarcity of available space may be expected to prevent such further expansion in the heavier industries in Brooklyn. This section no longer has an unlimited offering of cheap land on the waterfront or is equipped with railway sidings. It can offer, however, easy access to a large number of docks and to labor supply. But it is light rather than heavy industry which appears to be able to make the most profitable use of these facilities". (15)

(14) Regional Survey of New York and Its Environs, Vol. I, page 95.

(15) Regional Survey of New York and Its Environs, Vol. IA, The Chemical Industry, page 17.

Summarizing for the industry as a whole, the report states that "New York and Its Environs seems destined to maintain its position as a chemical center. So long as the rapid transit system continues to be of the radial type, certain plants using large forces of female operatives, such as those manufacturing toilet preparations and patent medicines, will cling tenaciously to central locations. The industry as a whole, however, tends strongly toward locations in the environs, and particularly in the 'heavy' and 'nuisance' branches, toward locations in the western rather than in the eastern sections of the Region". (16)

Time has proven the accuracy of the predictions as to the relative unimportance of heavy chemicals, explosives, petroleum and products listed as "other chemicals" in the city. Trends in fine chemicals and soap and toilet preparations have already been discussed. The continuing importance for the entire industry of lower Manhattan, Brooklyn, and Queens, relative to upper Manhattan, The Bronx and Richmond, should be noted. Also the fact that in 1935 Brooklyn and Queens together had about the same number of employees engaged in the production of chemicals as had lower Manhattan! Figure 26.

Summary for Chemicals

The industry is one of the least important of the nine studied. Figure 8. There has been a fairly steady growth, with a slight decline from 1929 to 1935, but there were more workers in 1935 than in 1922. Lower Manhattan is about equal in importance to Brooklyn and Queens combined, and is more important than at any time previous to 1929. Over 50 percent of the workers engaged in the production of soap and toilet preparations and fine chemicals are in lower Manhattan. Figures 27 and 28. Upper Manhattan, The Bronx and Richmond are relatively insignificant. Figure 26. Brooklyn, Queens, upper Manhattan, The Bronx and Richmond are less important than they were in 1922. Since 1929 upper Manhattan, The Bronx, and Richmond, are the only sections actually increasing, while lower Manhattan showed the greatest decline.

From 1922 on, soap and toilet preparations have continued to represent about 25 percent of the industry. Other branches have varied in their relative importance.

Of all the branches, soap and toilet preparations have shown the most steady upward trend. Many

(16) Regional Survey of New York and Its Environs, Vol. I, page 95.

of the branches have shown a number of ups and downs. Heavy chemicals, explosives and petroleum all have fewer employees than they had in 1900, but all three had more employees in 1935 than in 1929! ⁽¹⁷⁾

Employees per Plant. In all branches the number of employees per plant is less than in the period before 1922. With the exception of explosives and heavy chemicals the average number of employees per plant is less than in 1922. This would seem to indicate that except for these two branches either the size of the plant is decreasing or there is an increase in the use of machinery. Figures for size of plant do show a smaller rate of increase from 1922 to 1929 for the large plants than in the medium or small plants.

Census of Manufactures Figures. Analysis of these figures which, it must be remembered do not correspond exactly to the State Factory inspection records, shows certain interesting facts. (1) There has been a fairly steady decline in the number of employees in the chemical industry in New York City since 1927. There were even fewer employees in the industry in 1935 than in 1933. (2) Figures for employees in the entire country on the other hand showed that since 1927 there was a decline only in the period from 1929 to 1931. (3) In the United States since 1921 there was a decline in the number of plants from 1929 to 1933. At all other times they were increasing. Figure 29.

The Tobacco and Wood Industries

Some of the industries which were leaving the center of the city in 1923 were merely moving to outer fringes of the metropolitan area. Others showed little propensity to thrive in any part of the Region.

Tobacco

First among this latter group was the tobacco industry. Why was this industry declining in relative importance in New York and Its Environs? The answer is probably that tobacco manufacturing is of the supplementary type of industry. By this we mean that the industry is one which utilizes a surplus supply of labor in locations to which population is drawn by some extractive industry. In New York and Its Environs two-thirds of the

workers are women, and the employment of female labor is increasing due to the greater use of machinery that can be operated by unskilled labor. The labor cost in cigar making sometimes runs as high as forty percent. Hence manufacturers seek the cheapest possible labor, choosing locations where the industry can have the supply of female labor entirely to itself. They have, for example, tended to locate in towns in New Jersey where they could supplement metal or chemical plants.

In 1925 cigarette manufacturing was continuing to hold its own in the center of the New York area. This was largely due to the fact that the industry had been very prosperous and consequently economies in location were not particularly important. The prediction was made, however, that if in the future competition should force closer attention to costs cigarette factories might be forced to move, probably outside of the metropolitan area where the factories could locate as complements of the extractive industries.

Wood Industry

The wood industries group was also declining in the early 1920's. Lumber and planing mill products showed a strong tendency to abandon central locations and to scatter to the outskirts of the New York Region, or leave the Region entirely. This was due to the large space demands of the plants, and to the fire hazards which make them unpopular as neighbors. In fact, increased rentals and insurance charges had driven the furniture industry from lower Manhattan to The Bronx and Queens. On the other hand, the advantages which accrued from central locations were relatively slight. For example, accessibility to large numbers of persons was not important. The slow rate of growth for the industry as a whole was also due to the decline in the use of wood and to economies which result when manufacturing is done near the source of raw materials, in order to achieve reductions in weight and bulk. As in the case of tobacco, the wood industries have continued to decline since the earlier studies were made. The decline, however, has not been as rapid. Figure 8. Only a few statistics relating to the various branches were summarized, but the figures seem to indicate a decline in the relative importance of furniture, pianos, musical instruments, and lumber and planing mill products, and an increase in the category described as "other wood products".

It has been impossible to make a detailed analysis of these industries at the present time,

⁽¹⁷⁾ The figures for heavy chemicals and explosives are subject to verification. Too much importance should not be attached to them until their accuracy can be ascertained.

but the continued decline in their importance in New York City is in itself significant. It is well to point out, however, that further study of the factors causing this continued decline might prove fruitful. It may be asked why New York City cannot keep a greater number of firms in these industries within its boundaries? Is it perhaps due to an absence of cheap land with adequate transportation facilities available? If this is the

case, should efforts be made to keep these industries in New York or should they be encouraged to move? Have the industries left the entire metropolitan area or are they located in the 20-mile zone or on the outskirts of the Region? In planning a more economic organization of the city in relation to the Region such questions should and doubtless will be considered by the City Planning Commission.

Population Pattern

INTRODUCTION

Discriminating analysis of population data and preparation of estimates for the future are fundamental to the work of every city planning agency. The Mayor's Committee on City Planning was fortunate that the field had already been competently explored by the Regional Plan Association.

The particular contribution made by the staff of the Mayor's Committee is therefore not a mere new set of predictions; but a thorough examination of those already made, coupled with the first detailed forecast of future population distribution within the borders of each of the five boroughs of New York City. The reader is referred to *The Planning of Public Services for the City of New York*, Part II of the City-Wide Studies and to the "Residential Areas" section of this volume, for practical applications of the predicted population distribution within the several boroughs.

This report on Population Studies describes the general approach to the problems involved, and summarizes the resulting findings. It is believed that these studies will be useful to the official City Planning Commission in further studies of the residential and business development of the city and for consideration of needed permanent public improvements. These population studies were completed in 1935 and the original report was drafted in 1938, prior to the 1940 Federal Census.

PAST POPULATION GROWTH

The growth of population in New York City, in New York State and the continental United States shown in Figure 31 is based upon reports of the Federal decennial census for the years 1790 through 1930. This Figure also shows by curves the proportion of the country's population in the state and in the city, as well as the position of the city relative to New York State. The curves for years subsequent to 1930 represent estimates of future population growth which are discussed in succeeding pages.

It is significant that the phenomenal growth of the country as a whole has been exceeded by the rate of population increase in New York City. Up to 1930 the city gained a larger and larger share of the total United States population, as will be noted in Table 6. Similarly, the city has obtained

an increasing percentage of the population of New York State. The state has consistently gained in numbers, but its proportion of the national population decreased steadily from 1830 to 1890. Since 1890 the state's ratio has been nearly constant, ranging from 9 to 10 percent of the nation's population.

TABLE 6
Relation of New York City to U. S. A.
Population, 1850 to 1930

Year	New York City Population	Percent of U. S. A. Total
1850	696,115	3.00
1870	1,478,103	3.83
1890	2,507,414	3.98
1910	4,766,833	5.19
1920	5,620,048	5.32
1930	6,930,446	5.60

The curves in Figure 31 are plotted on semi-logarithmic paper so that changes in slope give a visual measure of *percentage changes* in the rate of growth. Examination of the chart will show that from 1860 to 1930 New York City progressed at an almost constant percentage rate, and therefore added a larger absolute number of people in each decade than in the decade that came before.

1934 Real Property Inventory

The 1934 Real Property Inventory was a house to house canvass. Among other things, this survey reported the population and number of families living in each block of the city and revealed that for the first time in its history the city lost population, the total being only 6,874,154 as against 6,930,446 in 1930. This slight loss may have been more apparent than real. No census is entirely accurate, and it is more likely that some people were not counted than that others were enumerated twice. It is possible that the Real Property Inventory, despite evidence of painstaking work, may not have been quite as complete as the Federal census. There is, however, ample proof from other sources that the depression brought a marked exodus from urban to rural areas. A net loss of 56,000 people for

New York City would not be unreasonable, in the light of this consideration alone.

The Mayor's Committee on City Planning made special arrangements for access to the field sheets of the Real Property Inventory. From these sheets the Committee's staff tabulated the number of inhabitants in every block of the city and prepared a study map showing the numerical population in each block. Field inspections were made to check apparent errors wherever the mapped data failed to agree with other information available to the staff. These block population maps, together with other block data, formed the basis for more detailed studies of population distribution discussed in succeeding pages of this report.

These same data were mapped in color, each color representing a specific range of population within a block, such as 300 to 499 people, 500 to 699, et cetera. This simplified color map gives a clear picture of the location and extent of population

the other boroughs failed to maintain the balance. The Bronx increased by 30,000 and Queens by 65,000 persons. Since before 1920, Brooklyn has had the largest number of residents; its total was 2,560,000 persons in 1930.

FUTURE POPULATION GROWTH

In 1923, the Regional Plan of New York and Its Environs retained several of the foremost population experts in the country to prepare estimates of the growth in the five boroughs of New York. These authoritative predictions, checked and counter-checked by independent statistical methods, were re-examined and revised after the 1930 census.

The Mayor's Committee staff considered the feasibility of preparing a new set of estimates. After considerable preliminary study, it was concluded that the staff's expectation as to future population did not differ markedly from the Regional Plan Association estimates. The prin-

TABLE 7
Population By Boroughs, 1930 and 1934

Borough	U. S. Census 1930	Real Property Inventory 1934	Ratio 1934 to 1930
Manhattan	1,867,312	1,724,245	92.4
Bronx	1,265,258	1,294,873	102.3
Brooklyn	2,560,401	2,550,448	99.4
Queens	1,079,129	1,144,250	106.0
Richmond	158,346	160,338	101.3
City Total	6,930,446	6,874,154	99.2

concentrations.⁽¹⁸⁾ The colored map, one of a series reproduced at a scale of 4,000 feet to the inch in collaboration with the New York City Housing Authority, was included as a supplement to the published report of the Real Property Inventory.

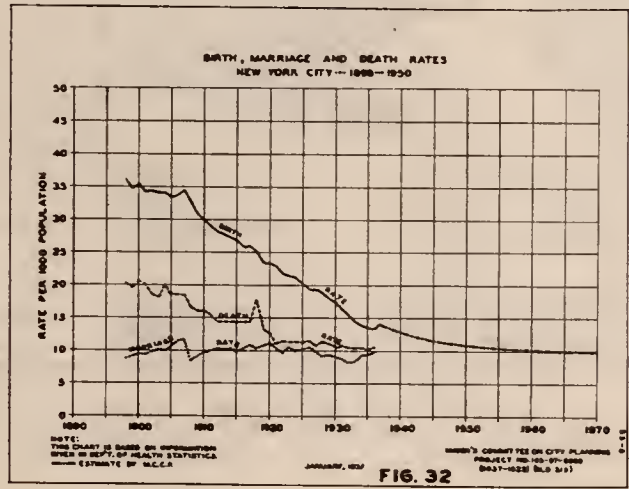
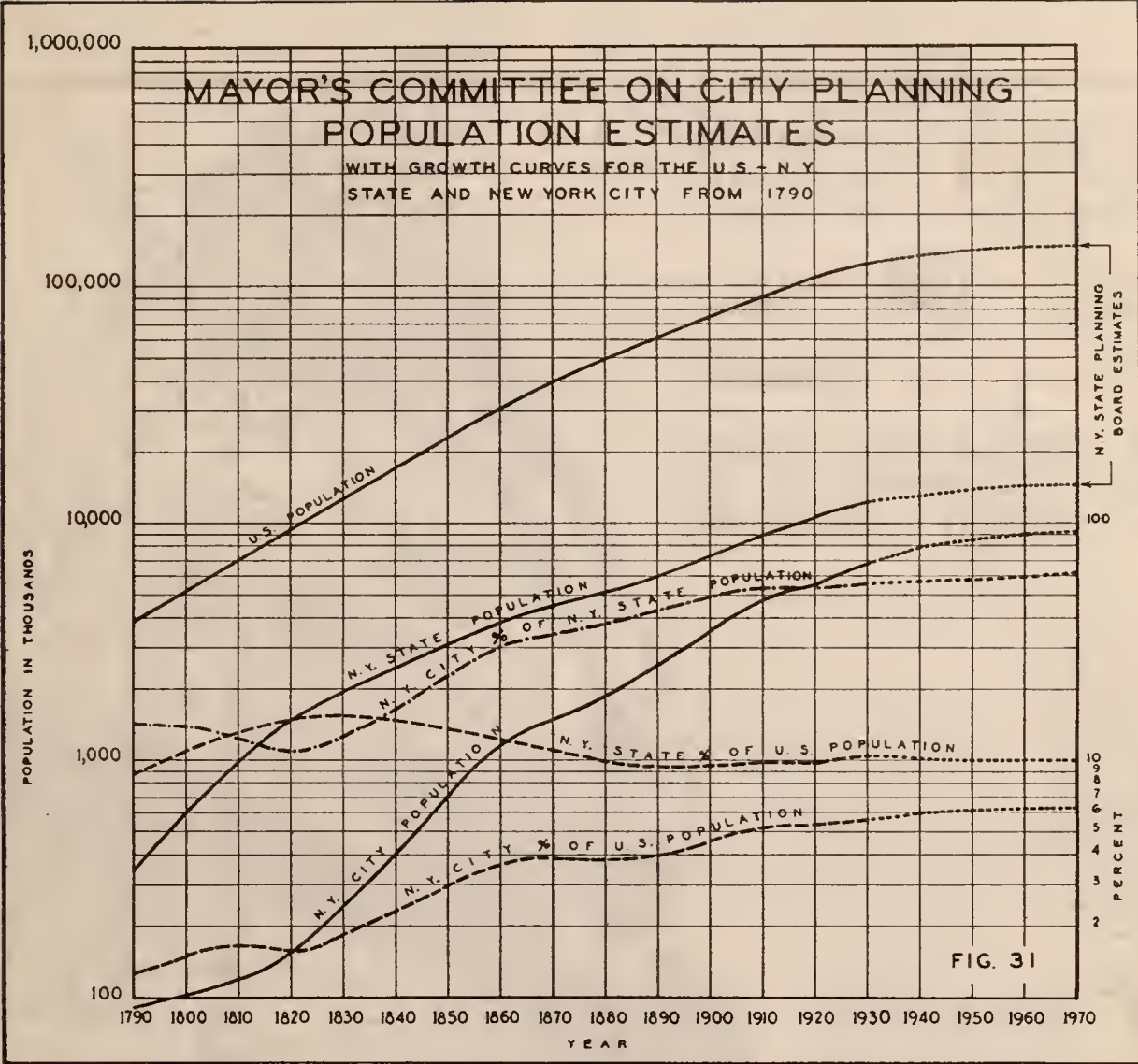
PRESENT POPULATION DISTRIBUTION

The 1930 and 1934 populations of the five boroughs are given in Table 7. Manhattan lost some 144,000 people between 1930 and 1934, thus continuing the downtrend which began in 1910. Brooklyn apparently lost 10,000, and the gains in

cipal point of variance was that the staff was inclined to anticipate a slower growth and moderately lower ultimate total.

Rather than introduce an independent set of figures, arrived at by some different method of calculation, it was decided to accept the estimates for 1950 prepared by the Regional Plan Association in 1932, as probably representing the ultimate totals that would be reached by 1970, thus discarding the moderate growth from 1950 to 1970, predicted by the Regional Plan. The staff made an exception in the case of Manhattan, which is expected to continue to lose population, though at a progressively slower rate. It was decided to use the Regional Plan's 1965 estimate

(18) For a further description of this map see the "Residential Areas" section of this volume.



MAYOR'S COMMITTEE ON CITY PLANNING THE CITY OF NEW YORK

FIORIELLO H. LA GUARDIA
MAYOR



TIMOTHY J. SULLIVAN
CHAIRMAN

MARCH - 1936

SCALE IN FEET
0 4000 8000 12000

1934 POPULATION DENSITY BASED ON ANALYSIS OF REAL PROPERTY INVENTORY

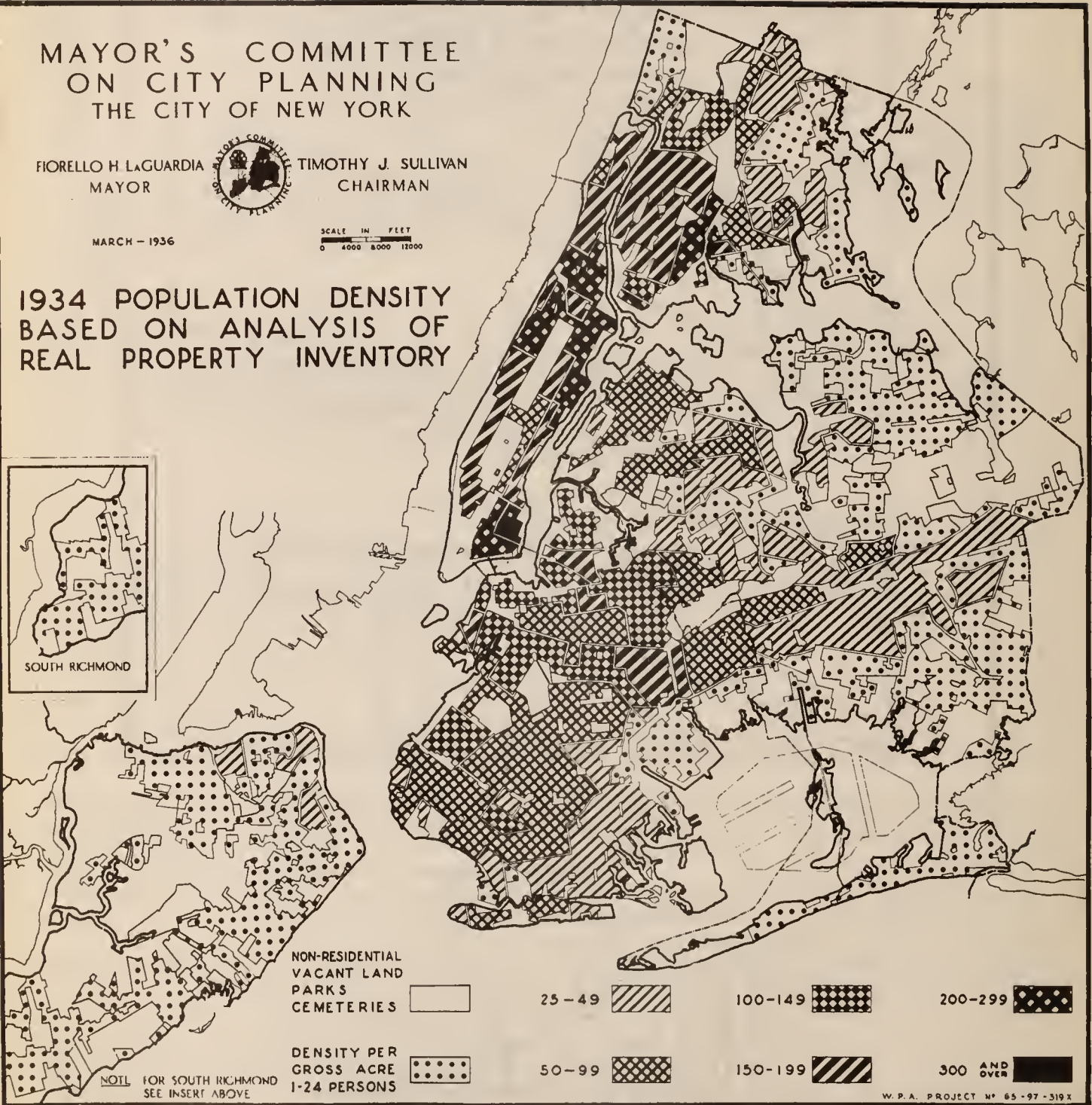


FIG. 33

for Manhattan as representing a reasonable figure for the year 1970.

In January 1938 the Regional Plan Association again re-examined its predictions for population growth and published revised estimates through the year 1960. These new figures could not be used to advantage by the Mayor's Committee, as its population studies and other analyses based

the Regional Plan Association are only 157,000 or 1.7 percent higher than those employed by the Mayor's Committee staff. The largest discrepancies in Manhattan and Queens, are both under 3 percent. With agreement as close as this, it is not necessary to question disparities or undertake readjustment of the figures used by the staff. The fact that the staff's total for 1970 is lower than

TABLE 8
Comparison of Population Estimates By Boroughs

Borough	Regional Plan* For 1965	Mayor's Committee** For 1970	Regional Plan*** For 1960
Manhattan	1,678,000	1,678,000	1,727,000
Bronx	2,478,000	1,987,000	2,039,000
Brooklyn	3,965,000	3,327,000	3,327,000
Queens	2,620,000	1,900,000	1,956,000
Richmond	600,000	335,000	335,000
City Total	11,341,000	9,227,000	9,384,000

*Estimate made in 1932. **Estimate made in 1935. ***Estimate made in 1938.

on these studies were already completed. Table 8 gives the two sets of Regional Plan estimates and also the figures adopted by the staff of the Planning Committee. It should be pointed out that the 1932 predictions represented a substantial reduction from the original estimates made for the Regional Plan of New York and Its Environs in 1923.

It will be noted that the latest predictions by

the Regional Plan's most recent estimate for 1960 is itself significant, as both figures have been questioned by responsible students as representing possibly over-liberal predictions.

It is also of interest to note that the staff's figure of 9,227,000 for the ultimate total represents an increase of only two and one-quarter million people over the present population. It is undoubtedly true that many people are accustomed

TABLE 9
Population of New York City By Boroughs, 1930 to 1970

Year	Manhattan	Bronx	Brooklyn	Queens	Richmond	Total—NYC
1930	1,867,312	1,265,258	2,560,401	1,079,129	158,346	6,930,446
1935	1,722,967	1,457,345	2,736,517	1,290,600	182,571	7,390,000
1940	1,716,577	1,593,408	2,874,632	1,426,480	208,903	7,820,000
1945	1,710,187	1,704,165	2,989,790	1,542,000	233,858	8,180,000
1950	1,703,797	1,805,495	3,100,428	1,651,662	258,618	8,520,000
1955	1,697,407	1,878,878	3,184,506	1,738,157	281,052	8,780,000
1960	1,691,017	1,938,471	3,255,300	1,813,212	302,000	9,000,000
1965	1,684,627	1,974,559	3,303,150	1,867,173	320,491	9,150,000
1970	1,678,000	1,987,000	3,327,000	1,900,000	335,000	9,227,000

Note:—Source: 1930 U. S. Census.
1935–1965 Mayor's Committee on City Planning Estimates.
1970 Mayor's Committee Adjustment of Regional Plan Association Estimates.

to think in terms of the recent rapidly expanding era of the city's growth, and have not yet realized that the former trend is unlikely to continue indefinitely. The man in the street will probably consider the staff's prediction as conservative, even to the point of being shortsighted, and will find it difficult to reconcile approaching stability of population with his conception of ever expanding development for the future of the City of New York.

Borough Estimates

Table 9 gives the estimates of the staff for each borough, by five-year periods from 1935 to 1970, with the census figures for 1930 shown for comparison. Figure 31 gives the same data in graphic form, as well as growth prior to 1930. The future growth of the city is also indicated on Figure 31, together with its relation to the growth of the State of New York and the nation as a whole.

Table 10 shows predicted population changes by boroughs from 1930 to 1970 on a percentage basis.⁽¹⁹⁾ It will be noted that the city is expected to gain 33 percent; that Manhattan continues to lose population; and that The Bronx and Queens are marked for increases of 57 percent and 76 percent respectively. Brooklyn, already approaching maturity, will grow at a more gradual pace, and Richmond, the least developed of the boroughs, may be expected to do better than double its present total.

TABLE 10
Percentage Population Changes By Boroughs

Borough	Percent Change 1930 to 1970
Manhattan	— 10%
Bronx	+ 57
Brooklyn	+ 30
Queens	+ 76
Richmond	+111
Total City	+ 33%

CRITICAL ANALYSIS OF POPULATION ESTIMATES FOR 1970

In lieu of independent studies the staff accepted the Regional Plan Association estimates substantially as revised in 1938. In order to determine

(19) Tentative figures released June 1940, by the Bureau of the Census on the 1940 Federal enumeration show the following population by boroughs: Manhattan 1,871,474; Bronx 1,385,777; Brooklyn 2,660,479; Queens 1,291,314; Richmond 171,215; and total New York City 7,380,259 persons.

their essential reasonableness it was desirable, however, to examine these 1938 estimates with special reference to the incidence of migration, changing birth and death rates, and the experience of other principal cities.

Migration

One of the more important factors of population change in New York is the effect of internal migration between the city and other sections of the United States, and external migration between New York and foreign countries.

Census figures are not available for all phases of these population movements. Analysis of population studies made by the late Dr. Walter Laidlaw, Director of the Cities Census Committee, indicates that the following figures approximate the changes in the population of New York City between 1920 and 1930, as the result of migration only (i. e. before allowing for the effect of births and deaths):

Natives of New York State (including New York City)	—314,700
Natives of Other States	+382,400
Foreign-born	+685,900
Net Migration to New York City, 1920-1930	+753,600

There is no specific information to indicate how much of the foreign-born migration was intra-state and interstate, as distinct from immigration from abroad. The intra- and interstate movements were, however, unquestionably considerable, as foreign immigration practically ceased after 1924. The decennial census reports show that the foreign-born population of New York State increased by 436,903 persons from 1920 to 1930, while that of the continental United States increased only 283,457.

With these figures as a working basis and assuming that two-thirds of those who came from abroad remained in New York, the principal port of entry, it is estimated that internal immigration of foreign-born to the city accounted for around 500,000 of the total foreign migration to New York City during the decade.

This estimate indicates the pronounced attraction to the city, quite apart from the former influx from Europe. Studies by the National Resources Committee confirm the resumption of the urban trend in the nation immediately after the rise began in 1933 from the bottom of the depression. The trend depends in part on the hope of greater opportunity in the city than in the country, and is partly motivated by higher pre-

vailing birth rates in rural areas and technological improvement in farming methods. Without attempting in this report to plumb the subject more deeply, there is reasonable basis for a belief that New York City will continue to draw migrants from other parts of the state and nation.

No letting down of the bars to immigration from abroad is now anticipated or recommended. It is nevertheless by no means an impossibility at some future time. For example, it might come about as the result of war or revolution in Europe and agreement by the United States to accept refugees.⁽²⁰⁾ Again, in the competitive race for foreign trade, with its ramifications of conferences, treaties and trade agreements, it is conceivable that the United States might permit immigration from over-populated countries in return for preferential tariff concessions. Certainly, when so much is at stake, it is not safe to assume that there will never again be substantial immigration from foreign countries.

If the net increase in the city's population by all forms of migration were to average only 250,000 persons per decade, the resulting gain would total 1,000,000 between 1930 and 1970, as compared with an increase of 750,000 from this source in the ten-year period 1920 to 1930.

Birth, Death and Marriage Rates

It is well known that the birth rate has been falling steadily since before the turn of the century. Figure 32 indicates the precipitous nature of this fall. In 1900 the rate was above 35 births per 1,000 population, excluding stillbirths, and in 1936 it was only 13.3. Unless present trends are reversed the rate will continue to fall, perhaps more gradually, and it may eventually stabilize at about 10 births per 1,000 population.

In the same period of years the death rate has been cut from 20.6 per 1,000 to about 10 per 1,000 population, despite the aging complexion of the population. It now appears that the death rate may fall as low as 8 or 7.5 and thereafter continue fairly constant.

The marriage rate has held nearly constant, with slight variations from an average of approximately 10 per thousand. Lower rates during depressions are normally compensated by increases as prosperous times return. It is safe to assume

that 10 per thousand will be the prevailing average rate in the future.

The combined effect of anticipated migration, plus the slight excess of births over deaths described above, would yield a population in 1970 slightly below the total of 9,227,000, which was estimated by other methods. However, the discrepancy is not great, and the assumptions made in the study of migration and reproduction rates are necessarily so general in character, that downward revision of the ultimate population estimates would appear unjustified and unwise. Rather, the estimate should be accepted as a top figure, to be used with discretion, and reviewed when further statistical data become available. There are other considerations involved, furthermore, which make it inexpedient to reduce the estimates at this time.

Proportion of the Nation's Population in New York City

Figure 31 shows that New York City has maintained a steadily increasing percentage of the total population in the country. In 1930 the city contained 5.60 percent of the nation's population.

Messrs. Warren S. Thompson and P. K. Whelpton, of the Scripps Foundation for Research in Population Problems, have prepared several estimates of the nation's population based on varying hypotheses respecting mortality, fertility, and net immigration. These are reported in "The Problems of a Changing Population", published by the National Resources Committee in May 1938. Their estimate for the case of "medium mortality, medium fertility and no immigration" is 151,170,000 in 1970. Accepting this prediction as representative of average probabilities, the Mayor's Committee staff estimate of 9,227,000 for New York City would represent only 6.09 percent of the nation's population in 1970. This would be a modest increment above 1930, in the light of rapid increases in recent decades. It is predicted that New York City will grow 33 percent in forty years, while the Thompson-Whelpton estimate noted above indicates a growth for the country as a whole of 23.2 percent during the same period.

Comparison With Foreign Cities

The continuing future growth of New York City relative to the United States, when the country as a whole is expected to grow more slowly, would be consistent with the experience of the largest cities in European countries. Stability of popula-

(20) This possibility seems rather likely as a result of subsequent events in Europe and the flight of peoples from invaded countries.

tion is closer at hand in many of these nations than in America.

For example, Greater London grew 43.6 percent from 1891 to 1931, while England and Wales increased only 27.4 percent. The Department de la Seine (Greater Paris) actually grew 34.4 percent from 1901 to 1931, while France excluding Alsace-Lorraine, grew less than 3 percent. There was no very appreciable immigration from abroad to either England or France. Judging by this experience it would appear that the largest city in the United States will have a more rapid rate of growth than the country as a whole.

FUTURE POPULATION DISTRIBUTION

Inasmuch as the staff estimates of the growth in the city and its five boroughs appeared reasonable, the present and probable future distribution of population within the boundaries of each borough were studied. The 1920 and 1930 pattern of population is given by census tracts for each borough. The 1934 distribution was revealed by the Real Property Inventory for census tracts and for blocks. Copies of tables and maps showing census data were made available to the staff by the Welfare Council. The probable future distribution of the estimated population within the five boroughs is not, however, readily determined through the use of projected trend curves for individual census tracts. Census tracts are merely statistical areas of convenient size, which permit direct comparisons of the changes recorded from decade to decade by the Federal census. They are not homogeneous in respect to the physical and social characteristics found within their borders.

With large unbuilt and sparsely settled areas in every borough, except Manhattan, it is evident that there is sufficient land to house a vastly greater number of persons than even the most liberal estimates of the city's ultimate population. The existing height and area provisions of the zoning resolution, furthermore, are not helpful in indicating either total population to be achieved nor its likely distribution by neighborhoods. The New York City Housing Authority has computed that the districts zoned for "residential use" could be developed to house 76,700,000 people! This figure is equivalent to the total population of all states east of the Mississippi River, excluding Florida, and is over ten times the present number of New York City residents.

The staff hesitated to introduce a new districting of the city but it was evident that a more rational grouping of blocks with certain common

physical characteristics was an essential foundation for planning studies. The existence of the block by block analysis of the Real Property Inventory made this new districting possible. The city was, therefore, divided into residential and non-residential study areas carefully determined on the basis of general homogeneity.

The residential land of the city was further divided into 725 study Areas according to the methods described in the "Residential Areas" section of this report. Tables and maps showing the population of each study Area were prepared from the staff's block by block analyses of the Real Property Inventory. It is not feasible to include these detailed data in this report, but the broad pattern of population distribution is graphically shown in Figure 33, the 1934 Population Density Map. It was then assumed that the growth of each study Area might proceed to saturation without changing the balanced proportion of housing types that characterize the present development of the Area. These totals, labelled "Estimated Potential", are given in Table 11 for each borough, together with their ratios to the 1934 population. As an example of the method, it will be noted that there is residential land enough in Queens for over 4,100,000 people, or 3.59 times the 1934 total, without increasing the present ruling percentage of the occupied land now built up with apartment houses. Today much land is not occupied, while the potential estimate is based on all residential land being used, though not to the limit of intensity permitted by the zoning resolution.

The calculation of "estimated potential" population for each of the 725 Areas was only a first step in determining future population distribution. This is self-evident from the fact that the total "estimated potential" for the City of New York is 15,802,000 persons, whereas the staff estimate of the ultimate population is only 9,227,000. ⁽²¹⁾

The "estimated potentials" for each Area were next examined and readjusted so that their totals by boroughs would conform to the "estimated probable ultimate" predictions of growth. This was done by applying variable factors: for the relative extent, adequacy and running time of

(21) In the spring of 1939 the City Planning Commission held a series of population hearings and released an interim report dated January 30, 1940, on the proceedings. As noted in this report the experts at these hearings generally agreed that the past optimistic expectations of a continued growth at a fairly rapid rate are not likely to be realized. The predictions made by these experts indicate that the city will continue to grow, but at a decreasing rate, and that the ultimate population may vary from some 7.6 million to 10 million persons. See Footnote 19 for preliminary figures on the 1940 census.

MAYOR'S COMMITTEE ON CITY PLANNING THE CITY OF NEW YORK

FIORIELLO H. LAGUARDIA
MAYOR



TIMOTHY J. SULLIVAN
CHAIRMAN

ESTIMATED ULTIMATE POPULATION DENSITY

NOVEMBER - 1937

SCALE IN FEET
0 4000 8000 12000

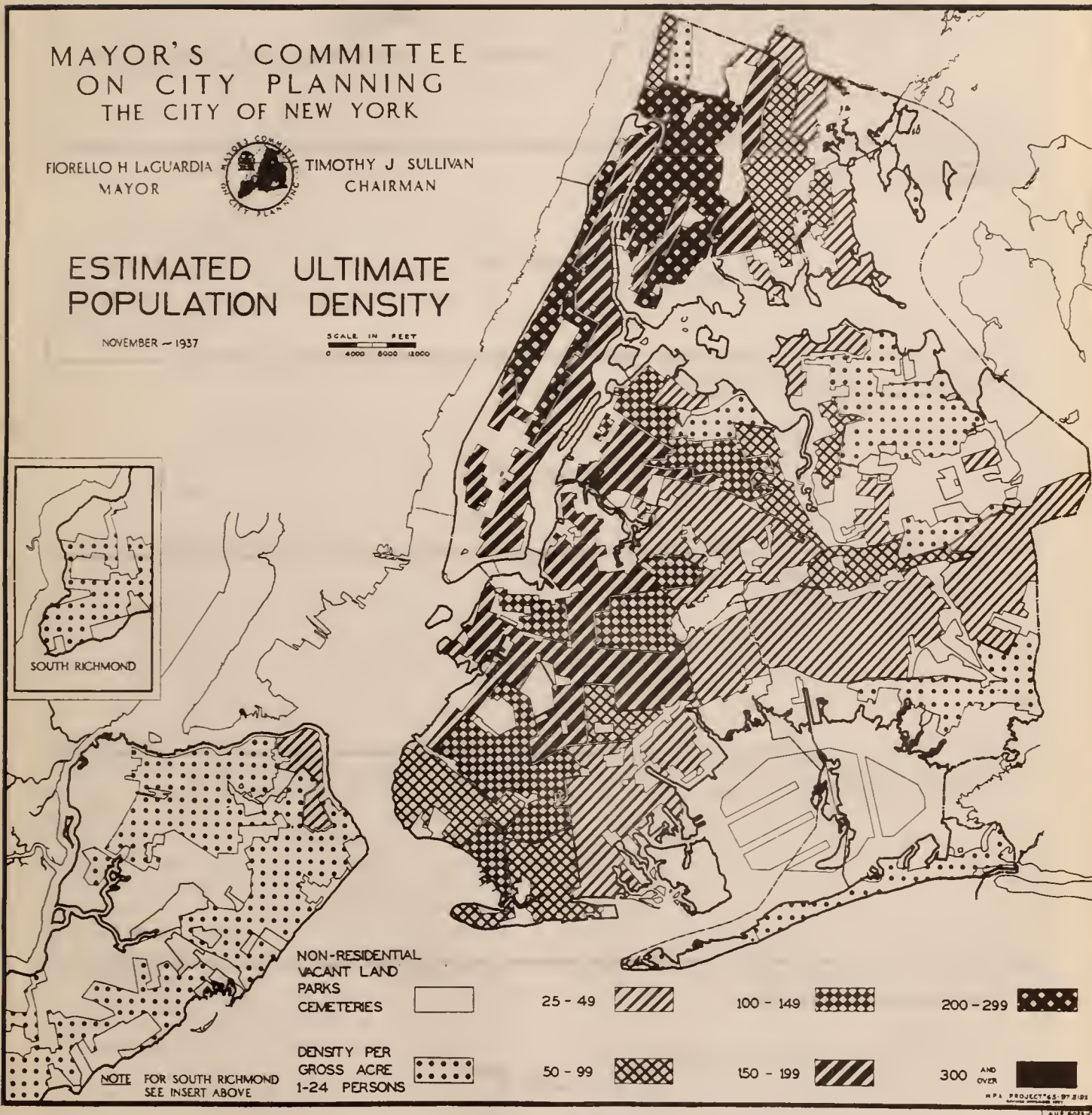


FIG. 34

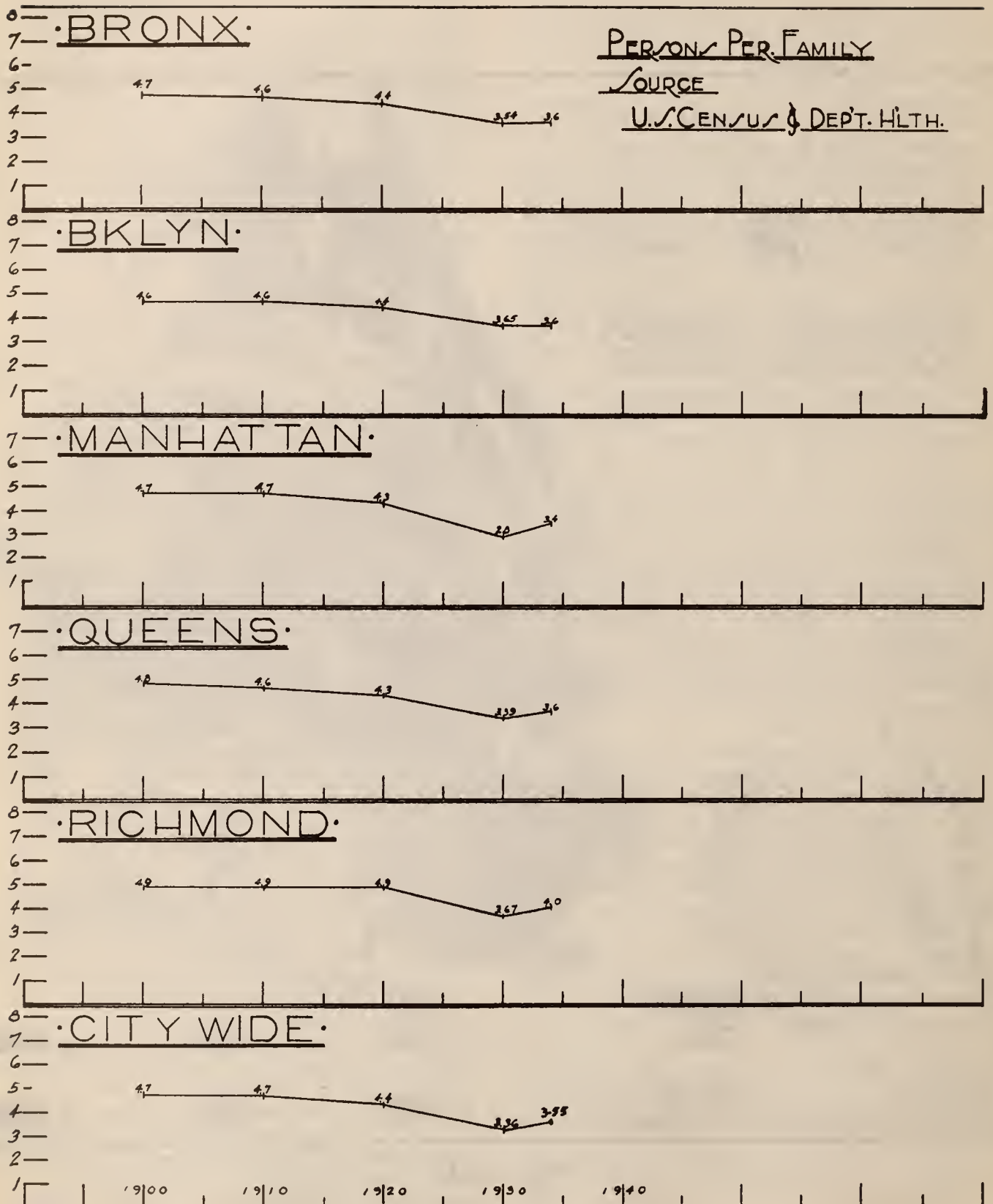


FIG. 35

transit service; the proportion of the Area unsuitable for building because of topographic or swampy conditions; and probable proportionate extent to which each Area will be fully built-up with residential structures, as distinct from the normal inter-mixture of non-residential uses and vacant lots. Appropriate allowance was also made for population that will live in predominantly non-residential districts not contained in the 725 residential study Areas. This latter classification totaled 236,362 persons in 1934 and is estimated to increase to 390,000 persons by 1970.

In addition to the borough population totals for 1934, the "estimated potentials" and the "estimated probable ultimates", Table 11 shows ratios relating the three sets of population figures. See Figure 34 for a graphic description of the ultimate population distribution.

pendent upon the way in which competitive opportunity is exercised.

Great pains were taken to develop a rational method of approach to the problem and the results, though not as accurate as the predicted borough totals, are believed to present a fair evaluation of the probabilities. ⁽²²⁾

The staff found this intricate series of estimates of decided value in the subsequent analysis of the future pattern of residential growth, and they will probably be useful in any comprehensive rezoning studies undertaken by the City Planning Commission.

The ultimate population figures for the 725 individual study Areas are entirely reasonable as to the number of people to be planned for, unless there are reasons for the people moving elsewhere, or unless it should become desirable and practicable

TABLE 11
Analysis of 1934 and Ultimate Population Distribution By Boroughs

Borough	1934 Real Property Inventory	Estimated Potential	Ratio Potential to 1934	Estimated Probable Ultimate	Ratio Ultimate to Potential	Ratio Ultimate to 1934
Manhattan	1,724,254	2,197,600	1.27	1,678,000	0.76	0.97
Bronx	1,294,873	2,488,200	1.92	1,987,000	0.80	1.53
Brooklyn	2,550,448	5,424,600	2.13	3,327,000	0.61	1.30
Queens	1,144,250	4,108,700	3.59	1,900,000	0.46	1.66
Richmond	160,338	1,584,900	9.90	335,000	0.21	2.09
City Total	6,874,154	15,802,000	2.30	9,227,000	0.58	1.34

It is believed that this analysis is the first comprehensive one made of the geographic distribution of future population *within* the separate boroughs. The smaller the area for which a population estimate is made, the greater become the chances of error due to circumstances that cannot be foreseen. As an extreme case, it is hardly possible to predict the future population of a single tenement house block, as it may be rebuilt in many different ways, or it may be purchased as an institutional or park site. Fortunately the residential study Areas are fairly large, averaging over 40 blocks, which reduces the hazards of error by bringing the law of averages into play.

It is obvious that there can be no finality about population estimates however carefully worked out. Every part of the city is at all times in active competition with every other part, and the future of each is in a considerable degree de-

to attract more people to the area. The final figures afford a realistic basis for considering the needs of each Area and for devising suitable public works plans for meeting those needs. ⁽²³⁾

(22) The "Residential Areas" discussed in succeeding pages of this volume was based in part on the "estimated probable ultimate" population of each of the 725 residential study Areas. After the staff had determined the indicated use of each Area in relation to the general city pattern of future residential development, the "estimated probable ultimate" population of some Areas was adjusted to conform with the population density expected to result from the type of residential building suggested for these Areas. The aggregate population of all study Areas in each borough was, however, maintained at the total figures given in Table 11.

(23) As mentioned in Footnote 22 the ultimate population figures for some Areas were adjusted to agree with the conclusions of the "Residential Areas" when the density resulting from a suggested type of residential development would produce a different ultimate population in these Areas. With the future population distribution indicated by the Residential Area conclusions as a base, the staff ascertained present deficiencies and future needs for public services of a local character. See *The Planning of Public Services for the City of New York*, Part II of the City-Wide Studies of the Mayor's Committee on City Planning.

TREND IN FAMILY SIZE

The average size of families fell from 4.7 persons in 1900 to 3.36 persons in 1920, for New York City as a whole. In Manhattan the drop was from 4.7 to 2.8 persons per family.

The 1934 Real Property Inventory recorded increases in size of families in every borough except Brooklyn. For the five boroughs combined, the average family was recorded as 3.55 persons. The increase over 1930 is probably more apparent than real, because of slight differences in the manner of defining a family. There is, however, no doubt that the "doubling up" of relatives during the depression accounted for a considerable part of the increase in the size.

The Mayor's Committee staff estimates that the average family will stabilize below three and one-half persons. It appears that the falling birth rate will probably be compensated in part by the greater longevity of parents and relatives who make their homes in the family. Variation in family size for each borough and the city as a whole from 1900 to 1934 is given by the curves in Figure 35. Predictions for the future trend in each of the five boroughs were also attempted.

PAST AND PRESENT POPULATION DENSITY

The staff prepared a map showing the distribution of population density per gross acre (excluding large parks) for 1934, based on the Real Property Inventory. This map, reproduced as Figure 33, serves as a supplement to the density maps published by the Regional Plan Association (Bulletin Number 7) for the years 1920 and 1930. The densities shown on Figure 33 were computed for residential study Areas, whereas the Regional Plan study was based on assembly districts.

The block by block analysis of the Real Property Inventory revealed that there were only 79 blocks in the entire city with a population in excess of 2,000 in 1934. This corresponds with a density of 375 persons per gross acre, measured to the center line of streets bounding a typical 200 by 800 foot block, or 545 persons per net acre. Manhattan has 55 of these 79 blocks; 22 are in The Bronx; and 2 are in Brooklyn. It is significant that the preponderance of congested blocks is in Harlem, not as formerly on the lower East Side.

ULTIMATE POPULATION DENSITY

The analysis of ultimate population distribution, described above, made it possible to prepare an

ultimate density map comparable in technique to the 1934 map. See Figure 34. Evidently, there is plenty of room for the estimated ultimate of 9.2 million people, found in New York today. A better distribution is desirable and can be achieved, with many sparsely settled areas building up by influx from sections that are now unnecessarily congested and thus less attractive as places to live. Some of the Manhattan Areas that are in the 200 to 299 persons per acre group are expected to drop below a density of 200 persons, on the assumption of eventual reconstruction with a lower lot coverage and less building bulk than were permitted for old law tenements. This applies particularly to the slum areas that are suitable as sites for low rent housing. There are many sections of Brooklyn, The Bronx, and Queens that will probably have a greater density of population in 1970 than they housed in 1934. Richmond could double its present population and still have less than 24 persons per acre, except in the built-up communities that fringe its northern shore.

NATIONALITIES AND THEIR DISTRIBUTION

The staff analyzed the 1920 and 1930 census reports to ascertain the predominant nationality of the population in each census tract, and the findings were carefully mapped in color. These original color maps cannot be reproduced in this report, but simplified maps in black and white, here shown as Figures 36 through 45, indicate the nativity of the predominant nationality in groups of tracts with 30 percent or more foreign-born or Negro population. During the decade, many significant changes took place in the distribution of the foreign-born and Negro population, as will be observed by reference to the maps.

With the drastic restrictions on immigration imposed by Congress in 1924, one might have expected to find fewer and smaller areas in 1930 with 30 percent or more foreign-born than in 1920. In several boroughs this does not prove to be the case. Examination of the census records from which the maps were prepared reveals that Manhattan lost 275,000 foreign-born, while The Bronx, Brooklyn and Queens all had large influxes, exceeding Manhattan's loss by a combined aggregate of 320,000 persons. This can only be explained by heavy immigration during the first years of the decade, coupled with continuing infiltration of foreigners from other cities.

An examination of the Manhattan maps, Figures 36 and 37, will show the extensive spreading of

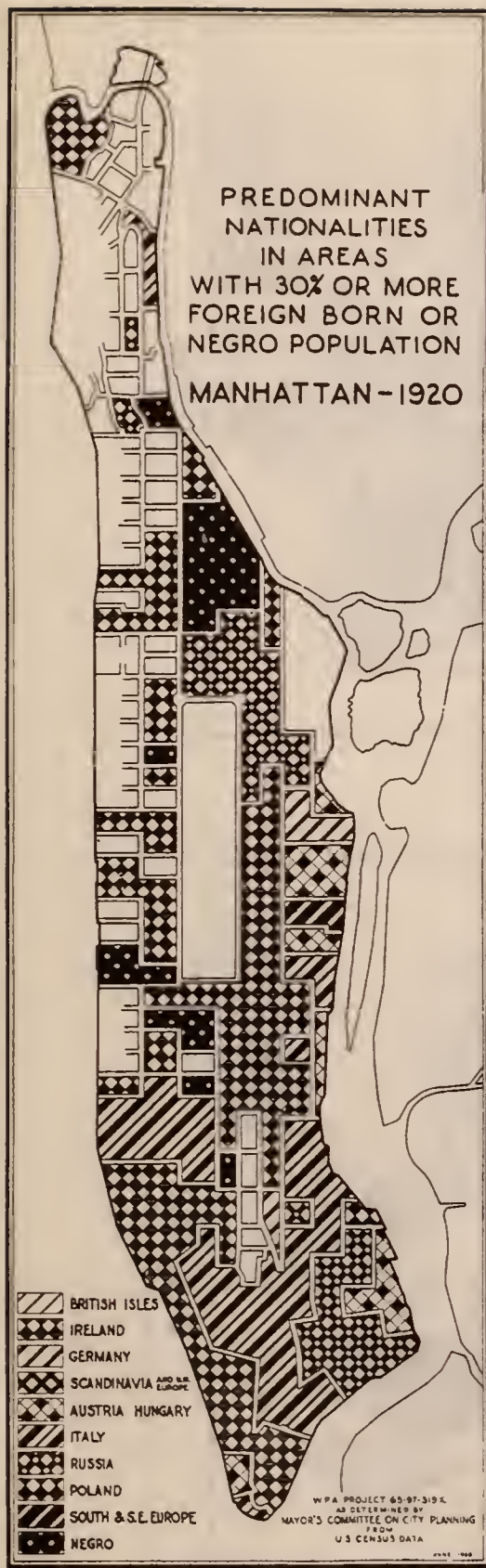


FIG. 36

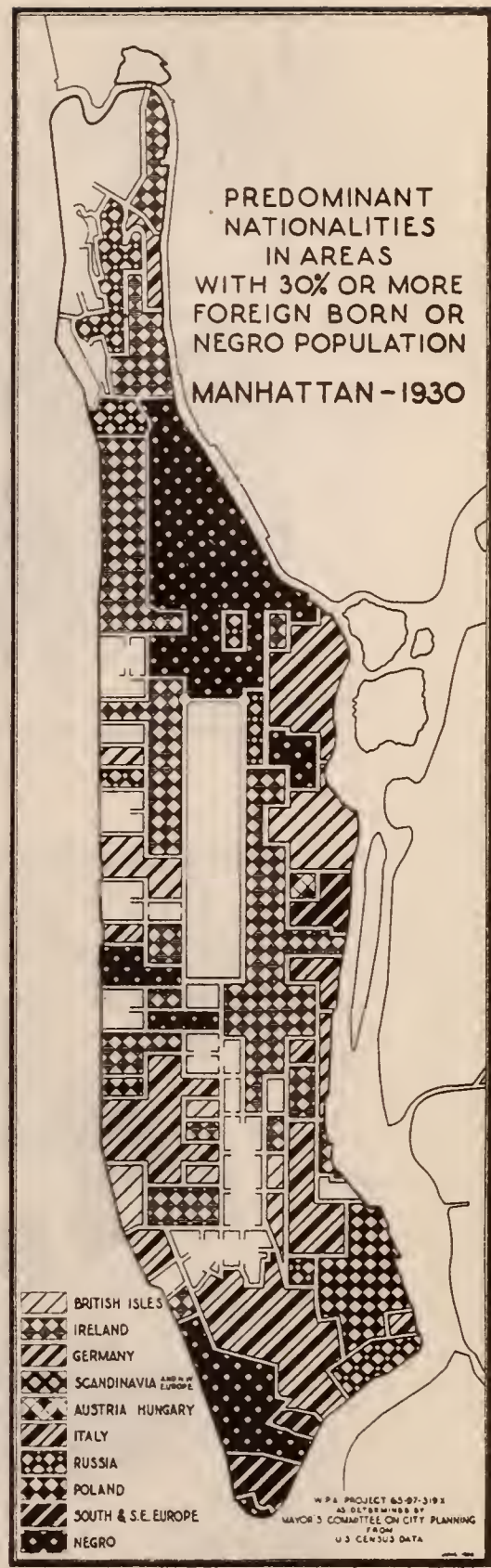


FIG. 37

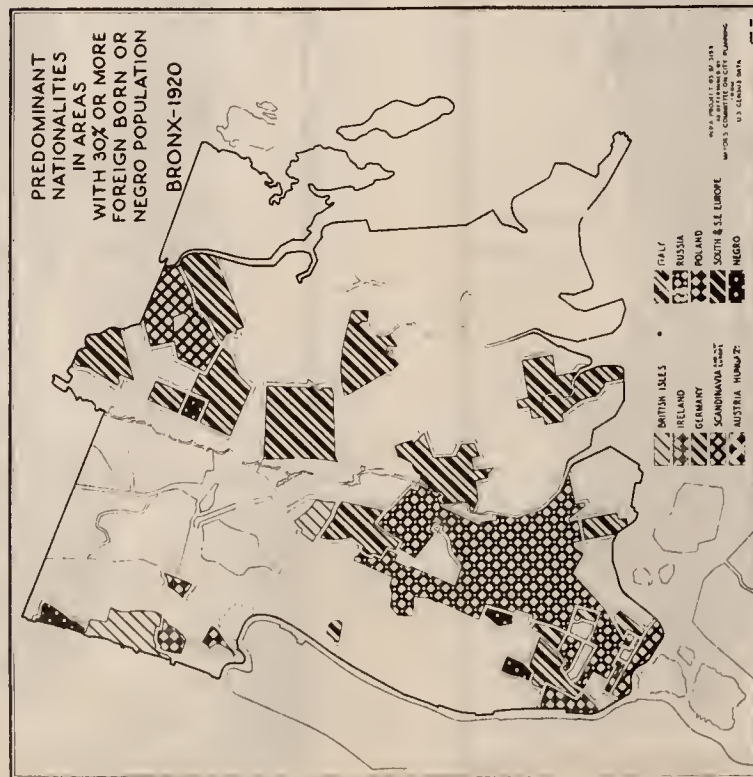


FIG. 38

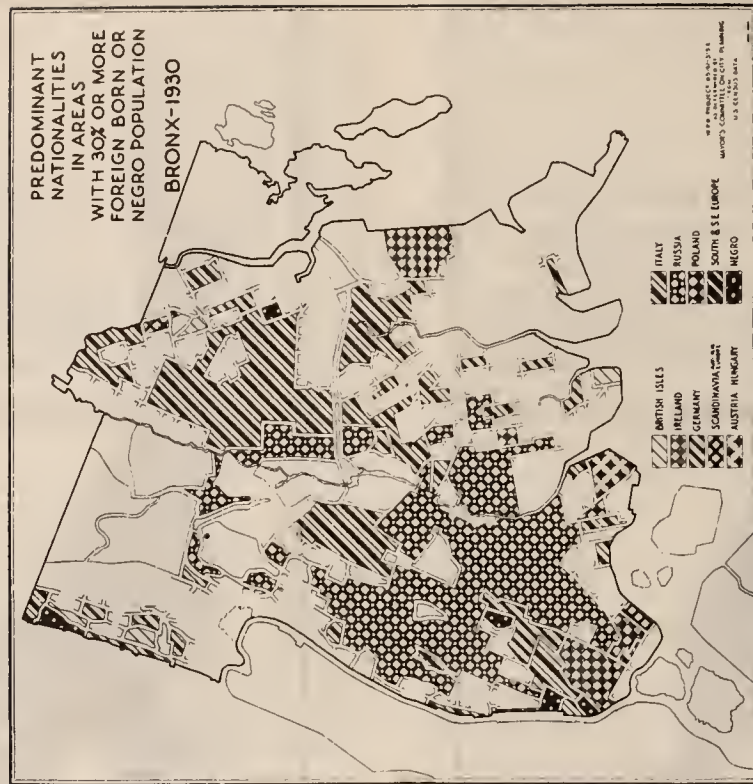


FIG. 39

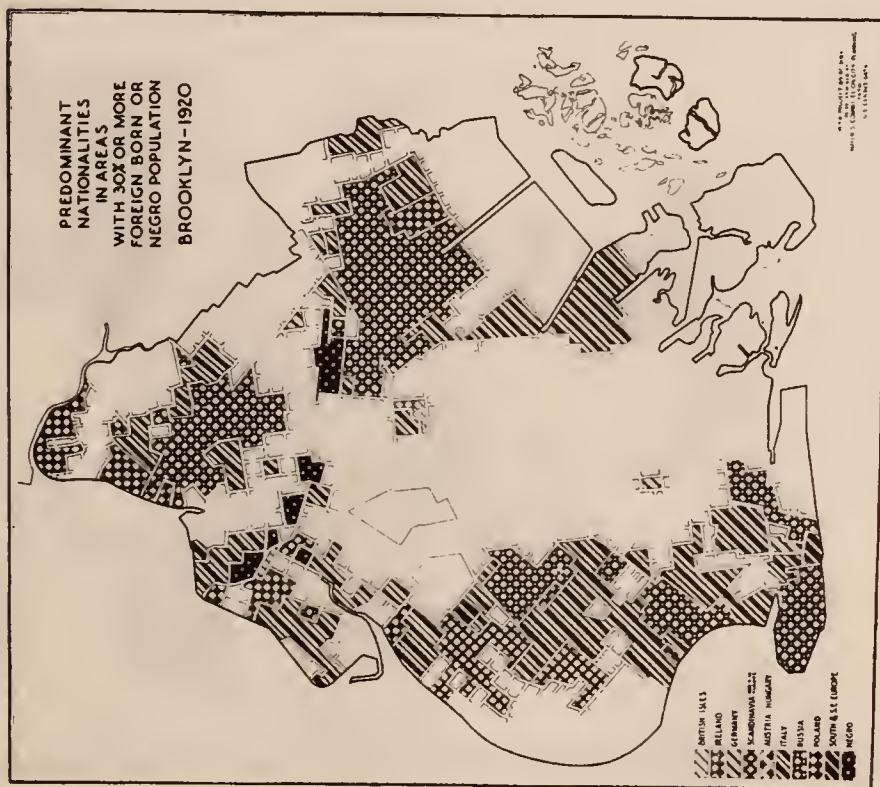


FIG. 40

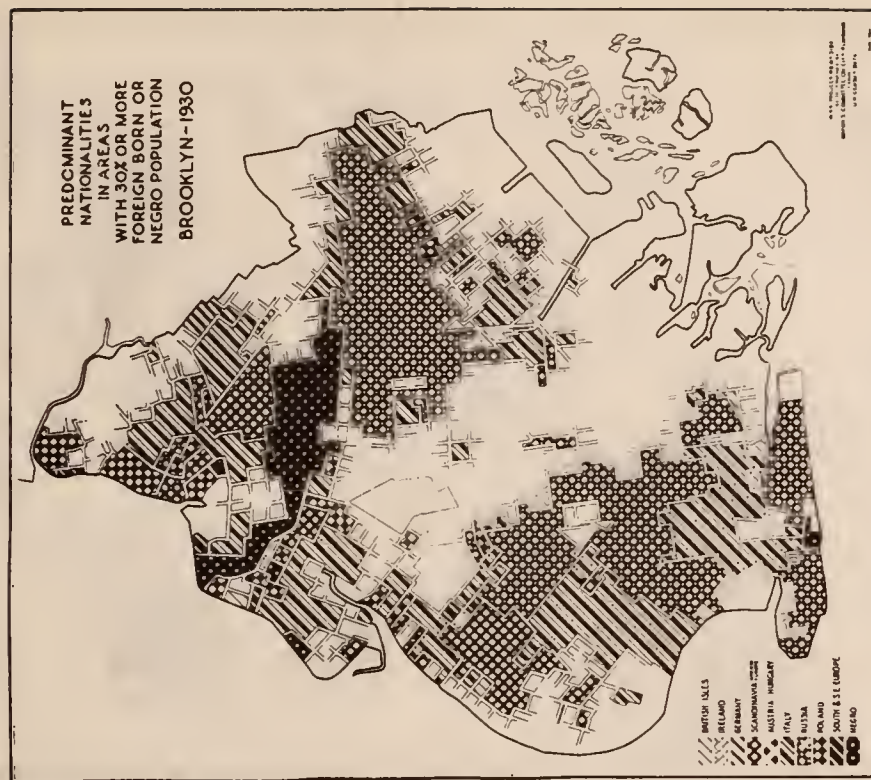


FIG. 41

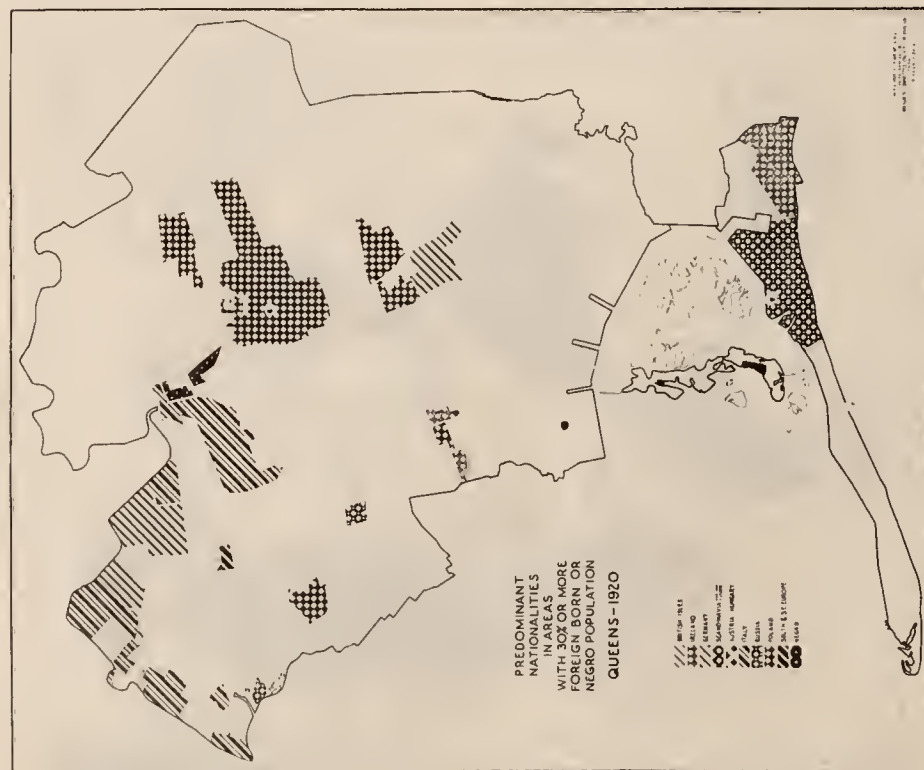


FIG. 42



FIG. 43



FIG. 44



FIG. 45

B3-6



MAYOR'S COMMITTEE ON CITY PLANNING
PROJECT NO. 165-97-6999
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the Harlem colored colony, and an exodus of Russians from the lower East Side. The Bronx maps exhibit marked increases of Russians and Italians in 1930. Figures 38 and 39. Unquestionably many of these were attracted from congested sections of Manhattan.

In Brooklyn again, a noteworthy change is the significant growth of the Russian areas. A large Negro section has developed in the northern part of the borough, and Italian neighborhoods have increased somewhat in number and size. In both census years, there is an almost complete absence of high foreign concentrations in Flatbush and Flatlands. Figures 40 and 41. Brooklyn gained 221,000 foreign-born during the decade, but without substantial change in its proportion of foreign-born to total population. It seems that this foreign influx centered in a few large well-defined districts, rather than distributing itself uniformly throughout the borough.

In contrast to Brooklyn, the Queens maps, Figures 42 and 43, show that a wide distribution has taken place. The 153,000 additional foreign-born formed many small new colonies. One large Polish section on the 1920 map has fallen below 30 percent, and thus no longer shows on the 1930 map.

Richmond likewise reveals scattered new colonies of relatively small area. The larger Polish, Italian and German sections have an undue prominence on the 1920 map of Richmond inasmuch as they were very sparsely settled. Figures 44 and 45. Moderate influxes of American-born citizens and other national elements since 1920 have caused the above mentioned sections to disappear from the 1930 map.

AGE DISTRIBUTION

New York City, as well as the United States as a whole, is faced with an aging population. There is a progressively larger proportion of people past middle life. The relative growth in numbers for the different age groups is indicated by Figure 46.

The trend springs from several causes, of which the decline in the death and birth rates is the more significant. As people live longer, and relatively fewer are born to take their places, the social implications of an older population are becoming extremely important, particularly from the planning angle. For example, more educational

and recreational opportunities will be needed for adults; relatively fewer elementary schools will be required for the smaller child population. ⁽²⁴⁾

Another cause is the cessation of immigration from abroad, a large part of which consisted of vigorous young people and children. A third factor, related to the other two, is that an aging population is a normal concomitant of a stable as against an expanding civilization. With the disappearance of the frontier and the boundless opportunities that trade and commerce offered during the pioneer period of rapidly increasing population, there comes inevitably a slowing up of tempo, less need for large families to help in the fields and the counting house, and a maturity of rural areas and cities alike.

CENSUS TRACT STANDARDIZATION

Prior to 1910 the Federal Census Bureau used assembly district maps for the enumeration and tabulation of population in New York City. This system of tabulation furnished comparable information from census to census on the population of the entire city and its boroughs. Unfortunately, it did not permit comparisons of population movements within borough boundaries. The legislature usually reapportions assembly districts following each State Census, often changing the number as well as the boundaries. The altered borders render these districts useless as a statistical base in determining intra-borough population trends.

In 1906, the late Dr. Walter Laidlaw advocated the establishment of "census tracts", pointing out that such permanent subdivisions would enable the Census Bureau to obtain for each succeeding census, accurate and comparable population information for every such area within the city. Following this proposal Dr. Laidlaw supervised the preparation of maps which divided the city into census tracts ranging from nearly 50 to over 5,000 acres. These maps were accepted and used by the Federal Census Bureau in the 1910 census.

City Departments found census tracts useful in administrative and statistical work. After adoption by the Health Department, census tracts were popularly called "sanitary districts". To comply with city requirements the tracts of 1910 were subdivided into units averaging 40 acres, and Dr. Laidlaw's revised maps formed the basis of both the 1920 and 1930 censuses.

Maps used for these censuses were based on

(24) For the effect of an aging population on future school needs the reader is referred to the chapter on "Education" in *The Planning of Public Services for the City of New York*, Part II of the City-Wide Studies of the Mayor's Committee on City Planning.

existing city maps which designate blocks by numerals. The Department of Taxes and Assessments assigns numerals to blocks, as and when needed, but with no regard for continuity. Consequently two or more blocks in a single, or in several different tracts, often receive duplicate numbers. While this duplication of block numbers is satisfactory for tax records, it requires complex indexing and lengthy descriptions for the Census Bureau to properly enumerate certain blocks.

Many city departments, New York State, and the Census Bureau find need for maps that will permit the registry and certification of block populations. To meet this requirement Dr. Laidlaw devised a method of alphabetical block designation, which retains the census tract numbers. As may be seen on the Brooklyn map in Figure 47, this system is self-indexing. For example, tract 243 in the center of the map contains 6 blocks, A to F inclusive. Each block is designated K243A, K243B, etc. K refers to Brooklyn (Kings County), 243 is the tract number and the letters of the alphabet indicate the individual blocks in this tract. Under the old system, blocks A, B, C, D, etc., all carried the same number. To obtain census data, the Borough, tract and block number had to be given and the boundary streets accurately described. With nearly 50,000 New York City blocks, the complicated block number system was unwieldy and often inaccurate for statistical purposes.

As in the past, maps acceptable to the Federal Census Bureau must be prepared locally if comparable tract or block population data are to be obtained from future decennial enumerations. Therefore, Dr. Laidlaw appealed to Langdon W. Post, then Chairman of the New York City Housing Authority, to sponsor a project for the standardization and expansion of census tract maps into census tract block maps. Dr. Carol Aronovici also foresaw the desirability of census groupings with permanent boundaries which would ultimately coordinate administrative work of all city departments depending upon census statistics. Consequently, Mr. Post sponsored a map revision project and Dr. Laidlaw commenced a

monumental work under the supervision of Dr. Aronovici, Director of the Columbia University Housing Orientation Study.

To establish permanent boundaries for future censuses, and to meet the exacting requirements of field enumeration, it was essential not only to designate tracts by number and blocks by letters, but also to indicate every city street, whether in existence or merely mapped. Dr. Laidlaw had access to the street status survey of New York City, completed in 1935 by the Mayor's Committee on City Planning, which furnished the only available information as to the actual existence of all streets shown on the official city map. As he had almost constant need for the original street status maps and other data in the files of the Mayor's Committee, Dr. Laidlaw was invited to join the staff. Every facility was placed at his disposal to aid in expediting his work.

On the accompanying Brooklyn map section, mapped but non-existing streets are indicated by broken lines and every undeveloped block is thus bounded and designated by letter for future enumeration.

The Brooklyn section is typical of the detail involved in map "standardization". As planned by Dr. Laidlaw, the city was mapped with Manhattan drawn on one sheet; The Bronx on two; Brooklyn, three; Queens, four; and Richmond, two sheets. After these new tract maps are used for enumeration and tabulation in succeeding censuses it will be possible to obtain information permitting direct comparisons of population movements on the basis of statistical areas with permanent boundaries.

In addition to the Mayor's Committee, various city departments, the Cities Census Committee and the Welfare Council rendered invaluable assistance to Dr. Laidlaw. He was also in constant touch with Mr. Batschelet, Geographer of the United States Census Bureau, to insure agreement in every detail. These maps were substantially complete at the time of Dr. Laidlaw's death, in May 1936, and they will remain as a memorial to his foresight and diligence.

LEGEND

===== CENSUS TRACT OUTLINES - STREETS IN USE
----- CENSUS TRACT OUTLINES - STREETS NOT IN USE
===== STREETS IN USE
----- STREETS NOT IN USE
----- STREETS IN ACTUAL USE BUT NOT SHOWN ON B.O.E. MAP
OF NOV. 1, 1953

CENSUS TRACT OUTLINES OF 1950 CHANGED IN 1965



COLUMBIA UNIVERSITY HOUSING ORIENTATION STUDY
DR CAROL ARONSON, Director

FIORIELLO H. LA GUARDIA
MAYOR



BERNARD S. DEUTSCHER
CHAIRMAN

BASED ON BOARD OF ESTIMATE AND APPORTIONMENT SECTION MAP OF NOVEMBER 1, 1933
 DR. WALTER LADLOW, SUPERVISOR (ORIGINAL SCALE 1 INCH = 1300 FEET)
 AMENDED FROM MAYOR'S COMMITTEE ON CITY PLANNING MAPS AS OF MAY 1, 1935

FIG. 47

Residential Areas

INTRODUCTION

One of the principal objectives of the Mayor's Committee on City Planning was a determination of the city's present and probable future pattern of development. The Residential Area study was primarily concerned with general land uses and with the city's residential areas in particular.

These investigations were carried forward simultaneously with population studies, and the conclusions presented herein are believed to constitute a broad but sound design for long-term residential development. This projected residential pattern served as a foundation for zoning studies and for analyses to determine the extent of public works and services required in the city's future residential areas. ⁽²⁵⁾

This chapter describes the staff analysis of the 1934 Real Property Inventory and outlines the other basic studies which lead up to the Residential Area Conclusions. It also discusses the procedures involved in the analyses of residential areas and the tests applied to the Conclusions. These investigations were completed during 1937 and the original report, drafted in 1938, has been extensively rewritten but not brought up-to-date.

1934 REAL PROPERTY INVENTORY ANALYSIS

The 1934 Real Property Inventory served as a primary source of information in these studies of land use and residential areas. When the Mayor's Committee on City Planning began its work in the spring of 1934, the Real Property Inventory was nearing completion. The Inventory was not only a census of resident and daytime population, but an enumeration of every building in the city. For each residential structure the Inventory recorded the type, age and condition, the rent paid for each dwelling unit, the vacant family quarters; and many other facts. ⁽²⁶⁾

The Mayor's Committee was fortunate in hav-

(25) See the reports on "Population" and "Zoning" in this volume and *The Planning of Public Services for the City of New York*, Part II of these City-Wide Studies for examples of the application of the residential conclusions.

(26) The Real Property Inventory was published in 1935 in five volumes on residential data and one volume on the non-residential survey. The reports were distributed by the New York City Housing Authority and may be seen in principal public libraries.

ing such complete and up-to-date information available. Arrangements were made for the staff to have access to the field sheets of the Inventory in order to make a block-by-block analysis of existing conditions in New York City.

Block Analysis

In its analysis of the Real Property Inventory field sheets, the staff determined and tabulated for each block in the city: the predominant use of land (e. g. residential, non-residential or vacant blocks); the number of persons living and working in each block; the predominant types of residential and non-residential structures; the predominant age and condition of residential buildings; the total number of and vacancy in dwelling units; the average number of rooms per unit; and the predominant rental per family quarter. This analysis of the field sheets was tabulated on special card forms, one card to a block.

The staff then prepared a series of color maps which show the characteristics of each block in the city. The base map used for this graphic presentation of the Real Property Inventory was a wall map of the City of New York at a scale of 2,000 feet equals one inch. Duplicate color maps at the same scale were made for each of the five boroughs to facilitate study of the data.

Color Maps

After a careful examination of the first tentative mapping tests, it was found that nine color maps would show the principal block data which would be of direct value in studying land uses and in appraising the character of residential areas. Accordingly, the staff concentrated on and completed the nine color maps described below. The spotting in color of Real Property Inventory data on maps of New York, at a scale of 2,000 feet equals one inch, involved more than forty thousand city blocks and was a major operation, but the results more than justified the work. ⁽²⁷⁾

Predominant Land Use

The reported utilization of the greater portion of the *area* of each block determined the "pre-

(27) For critical comments on these color maps, as subsequently reproduced, see the "Geographical Review", American Geographical Society, New York, N. Y., October 1936.

dominant" use. This map, distinguishing between residential, non-residential and vacant blocks, gives a vivid picture of the city's general development in 1934. It is perhaps one of the more interesting and instructive of the several color maps.

Predominant Type of Residential Building

This map shows by appropriate colors the types of dwelling which predominate in each of the city's residential blocks. Blocks are classified as multi-family, miscellaneous (rooming houses, apartment hotels, et cetera), two-family, single-family or predominant vacant lots (where less than one-half of the block was improved). Thus for the first time the character of New York's residential development was shown on a single map, which proved of considerable value in subsequent studies.

Predominant Age of Residential Buildings

The predominant age of residential buildings as of 1934 is shown for each block on this map in four groups: under ten years, ten to nineteen years, twenty to thirty-four years, and over thirty-five years. The latter group comprises chiefly the blocks of "old law" tenements which were built prior to the passage of the Tenement House Law in 1901. From this map one may trace, broadly, the periods during which various portions of the city were developed.

Predominant Condition of Residential Buildings

On this map was shown the predominant physical condition of dwellings in each block according to the Real Property Inventory designations, namely: *one* was first class condition; *two* indicated buildings needing minor repair; *three* portrayed blocks in which the majority of dwellings required structural repair; and *four* indicated residential buildings reported as unfit for habitation.

Predominant Rent per Family Quarter

The staff determined for each block the predominant or median monthly rent per dwelling unit by inspection of the Real Property Inventory field sheets. This information was shown on the original color map for each block according to the following rental ranges: under ten dollars per month; ten to (but not including) twenty dollars; twenty to thirty dollars; thirty to forty dollars; forty to sixty dollars; sixty to one hundred dollars; and from one hundred dollars or more per family quarter per month. This particular map

gives an unusual picture of the distribution of housing at the various economic levels throughout the city, and is one of the most useful of the map series.

Vacancy of Family Quarters

This map indicates the percentage of the total dwelling units in each block which were vacant in 1934. It shows whether the vacancies amounted to less than five percent, five to ten percent, ten to fifteen percent, fifteen to twenty percent, twenty to twenty-five percent, or over twenty-five percent of the total family quarters in each block.

Population

The number of persons reported as living in each block of the city is shown in color on the Population map, each color representing a numerical range. For example, the colors are arranged to show whether a block has one to fourteen residents, fifteen to forty-nine, fifty to ninety-nine, one hundred to one hundred ninety-nine, two hundred to two hundred ninety-nine, three hundred to four hundred ninety-nine, five hundred to six hundred ninety-nine, seven hundred to nine hundred ninety-nine, one thousand to one thousand four hundred ninety-nine, fifteen hundred to one thousand nine hundred ninety-nine, or two thousand or more population. The Population map thus reveals the general location and extent of the concentration of the city's inhabitants in the year 1934, which was quite useful in the several city-wide studies.

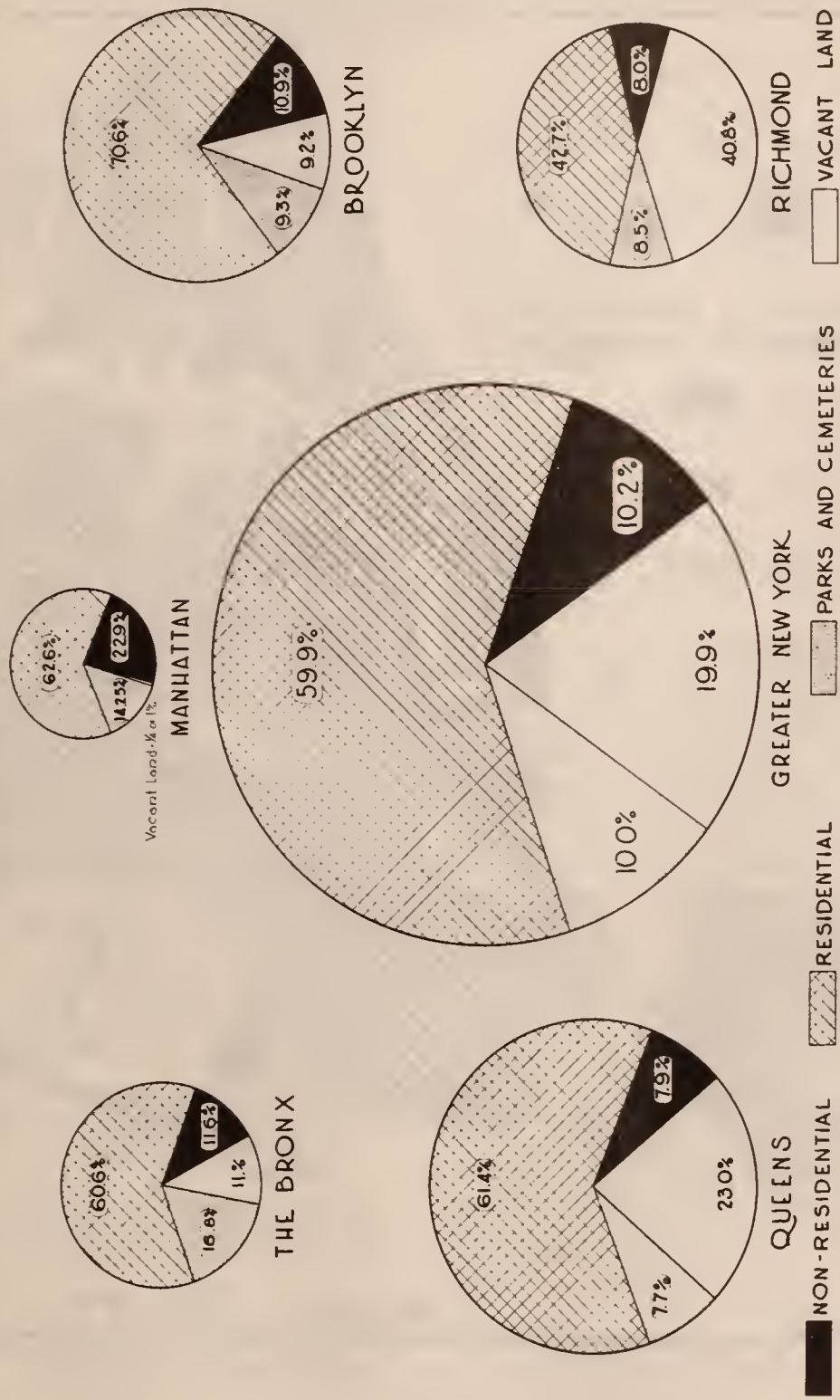
Predominant Non-Residential Type of Building

This map shows by a solid color over the entire block, for those blocks which are non-residential in character, the predominant type of non-residential structure. It also indicates by a color spot in the center of residential blocks the predominant type of non-residential structure scattered among residential buildings. Non-residential buildings are classified as follows: private institutions, public buildings, store, office or loft buildings, warehouses, garages, and factory structures.

Daytime Population

The Real Property Inventory enumerated "Daytime Population" which was defined as the persons regularly working in a structure or an area, regardless of place of residence, but excluding tran-

HOW NEW YORK CITY USES ITS LAND



PREDOMINANT USAGE BY BLOCKS AS DETERMINED BY THE
MAYOR'S COMMITTEE ON CITY PLANNING
FROM INFORMATION COLLECTED BY THE REAL PROPERTY INVENTORY-1934

FIG. 48

MAYOR'S COMMITTEE ON CITY PLANNING THE CITY OF NEW YORK

FIORIELLO H. LA GUARDIA
MAYOR



TIMOTHY J. SULLIVAN
CHAIRMAN

LAND USE BASED ON ANALYSIS OF 1934 REAL PROPERTY INVENTORY.

NON-RESIDENTIAL



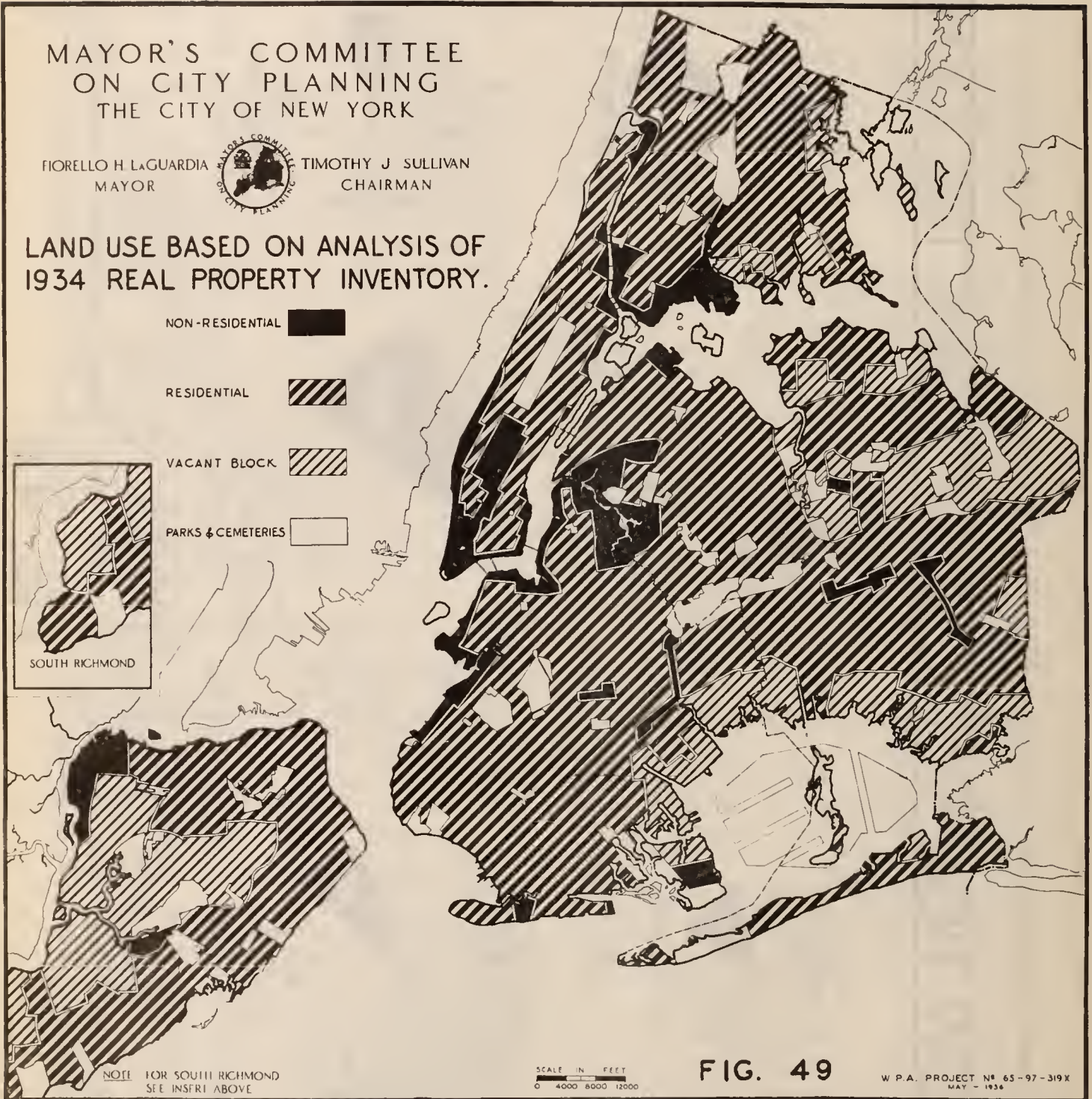
RESIDENTIAL



VACANT BLOCK



PARKS & CEMETERIES



NOTE FOR SOUTH RICHMOND
SEE INSERT ABOVE

SCALE IN FEET
0 4000 8000 12000

FIG. 49

W.P.A. PROJECT N° 65-97-319X
MAY - 1936

LA GUARDIA

sients, visitors to office buildings, and the like. ⁽²⁸⁾ The Day Population map shows, therefore, by a color series the approximate number of persons working in each block. The colors are arranged to show the following specific ranges: less than forty-nine workers per block, fifty to one hundred forty-nine, one hundred fifty to two hundred ninety-nine, three hundred to four hundred ninety-nine, five hundred to nine hundred ninety-nine, one thousand to fourteen hundred ninety-nine, fifteen hundred to nineteen hundred ninety-nine, two thousand to twenty-nine hundred ninety-nine, three thousand to thirty-nine hundred ninety-nine, four thousand to forty-nine hundred ninety-nine, and five thousand or more workers per block.

Reproduction of Color Maps

These color maps stimulated such interest in their clear portrayal of the Inventory data that seven of them were reproduced and published as a graphic supplement to the Real Property Inventory reports. The Land Use, Predominant Residential Type and Age, Predominant Rental per Family Quarter, Population, Non-Residential Type and Day Population maps were reproduced in color at a scale of 4,000 feet equals one inch, and distributed by the New York City Housing Authority. ⁽²⁹⁾

Analyses of Block Characteristics

Neither the original color maps nor the 4,000-foot scale copies can be satisfactorily reproduced at smaller scales. The staff therefore analyzed the original maps and prepared a set of black and white maps and graphs for publication and lantern slide use. These maps show the same general picture as the color maps, but do not show streets. ⁽³⁰⁾ This simplification produced broad patterns which emphasize the most striking and dominant characteristics of the city's pattern. The black and white maps are here reproduced along

with a series of pie charts, which permit a study of the quantitative and qualitative analyses of land use, residential age and type, and rental. The analyses discussed below are the results of a block by block study of the 1934 Real Property Inventory data. ⁽³¹⁾

Land Use

The charts in Figure 48 show graphically how New York uses its land, as one large city, and as five separate boroughs. For the city as a whole some 60 percent of the total blocks are predominantly residential in character. Nearly the same ratio of residential use prevails in Manhattan, The Bronx and Queens. Brooklyn is over 70 percent residential; and Richmond, because of extensive vacant areas, is just over 42 percent residential.

About 10 percent of the total blocks in the city are devoted to predominantly non-residential uses. In the borough of Manhattan, where the business of the metropolis is largely concentrated, non-residential uses are found in 23 percent of the blocks. Non-residential use varies from 8 percent in Queens and Richmond to some 11 percent in The Bronx and Brooklyn.

Parks and cemeteries comprise 10 percent of the city's area, with a range from less than 8 percent in Queens up to almost 17 percent in The Bronx. It is interesting to note that Manhattan, perhaps the most congested development of its size in the world, has 14 percent of its area in park land; cemeteries are a relatively small part of the ratio.

Vacant land is the second largest of the classifications; one-fifth of the city's blocks are unimproved. These vacant blocks are equivalent to one-third of the residential blocks, and are twice the non-residential and twice the park area. One is so apt to become obsessed with the problems of this modern Babylon that the amazing challenge of the enormous tracts of vacant and substantially unused land in New York is overlooked. New York City contains some 40,000 acres of vacant land, most of which is in private ownership.

The simplified Land Use map, Figure 49, shows that the city's predominant pattern is residential, with the well-known commercial and industrial districts—and some that are less well-known—standing out vividly in black. The vacant areas, referred to above, lie mostly in Queens, The

(28) An analysis of the numerical distribution of Daytime Population by borough is summarized in the "Rapid Transit" report contained in *The Planning of Public Services for the City of New York*, Part II of the City-Wide Studies of the Mayor's Committee on City Planning.

(29) A limited number of these color maps, as well as an Existing Streets and a Base Map, at a scale of 4,000 feet equals one inch, are obtainable from the New York City Department of City Planning. Copies may also be seen in local public libraries.

(30) An estimate of the area devoted to city streets is given in the "Public Property" chapter of the *Special Studies* section of this volume. Since this examination was based on a block analysis of the Real Property Inventory, only those streets which formed the boundaries between various districts are shown on the simplified maps.

(31) A subsequent land use survey, completed in 1938, shows the actual land uses by lot, within the predominant residential and non-residential areas as defined by the Mayor's Committee staff. The Department of City Planning is now completing analyses of this land use survey.

Bronx, and Richmond. On a map designed for reduction to so small a scale, it was necessary to omit a large number of the smaller areas of each land use classification. For more detailed study, the colored Land Use map should be consulted.

Type of Residential Buildings

It is striking to see that over one-half of the residential blocks in the city are built up predominantly with single-family houses. This is perhaps a surprising finding in a city so well known as the habitat of "cliff dwellers". Figure 51. The explanation is apparent from a study of the smaller pie charts depicting the individual boroughs. Figure 50. "Cliff dweller" blocks of multi-family buildings comprise almost 94 percent of the total of Manhattan, nearly 70 percent in The Bronx, and over 51 percent in Brooklyn. They are under 8 percent in Queens, which is the largest of the boroughs, and practically negligible in Richmond. Figure 50.

Only one single-family neighborhood of important size still persists on Manhattan Island—The East Sixties and Seventies. In contrast, Queens and Richmond are well-known as individual home boroughs, while Brooklyn still has about 28 percent of its blocks predominating in one-family houses. The newer boroughs, especially in their outlying sections, offer almost unlimited opportunities for any family that wishes to have a roof separate from its neighbor's. This opportunity must, however, be tempered with a caution against over-development of small-house building in inaccessible sections, merely because raw land is cheap and a demand can be generated by high pressure sales campaigns. It will be observed on the accompanying map, Figure 51, that large sections of single-family areas, now only partly developed, are a long way from any center of business activity.

New York is not a two-family house city, and there is evidence that this type of construction will be even less prominent in the future than in the past. Only one-eighth of the residential blocks in New York City are predominantly two-family. The two-family house reaches its greatest popularity in Brooklyn, particularly the southwestern sections. The borough total is 20 percent. The Bronx has nearly 15 percent of two-family blocks, and Queens 12 percent. In Manhattan, this type of construction is almost unknown, and in Richmond, it is negligible. Thus the densest and sparsest boroughs alike have relatively few blocks devoted to the two-family house.

Residential Age

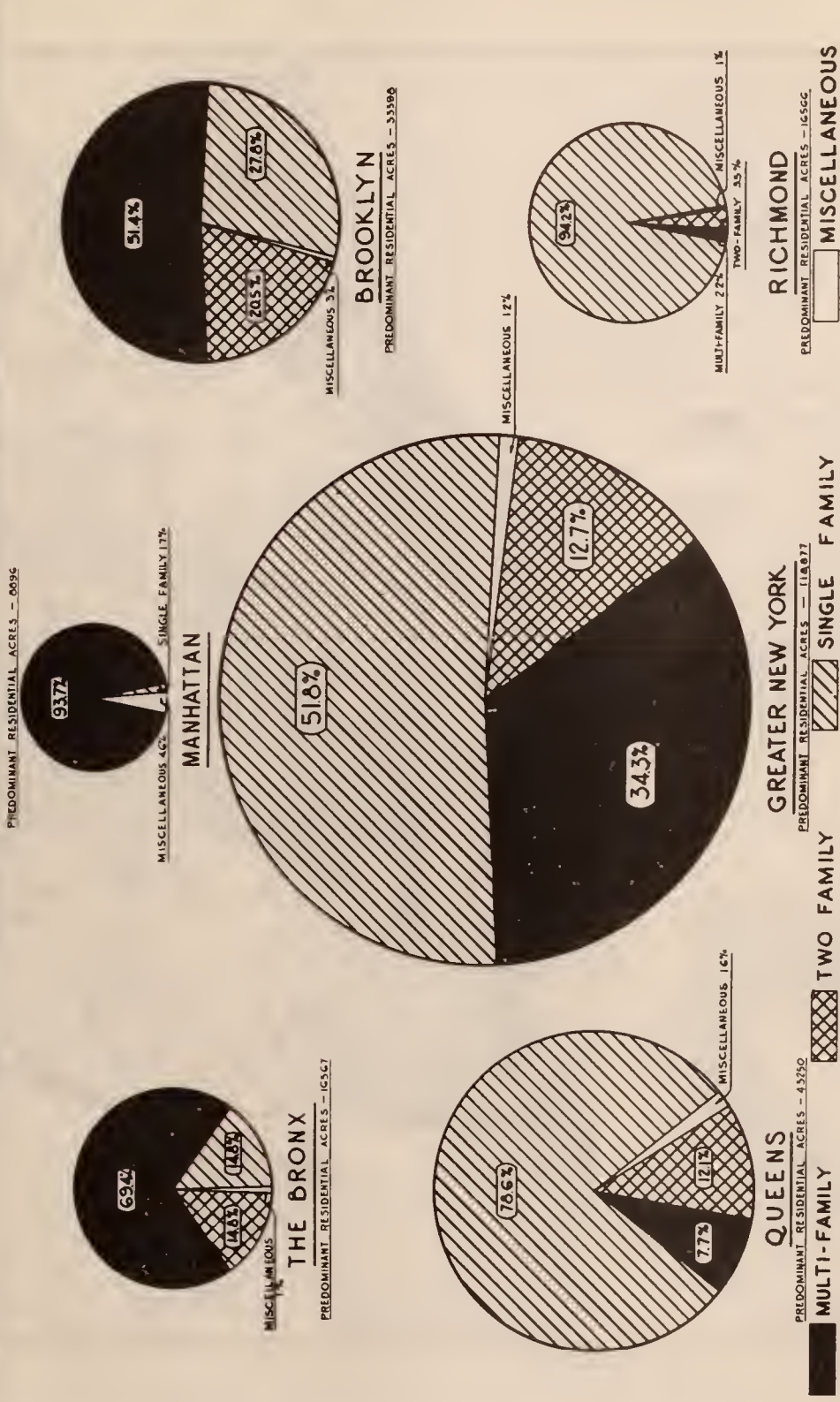
The age chart, Figure 52, indicates that New York City as a whole is not suffering from old age of its residential buildings. In 1934, less than 23 percent of the blocks were occupied by structures predominantly over 35 years old, as compared with 32 percent under 10 years of age. Manhattan with 76 percent in old buildings, and Brooklyn with over 40 percent, present the serious problems in this respect. Age, of itself, is of course not an evil. In New York age generally connotes obsolete design, inadequate light, air and living facilities, and often a woefully bad state of repair. Thus, in Manhattan, most of the residential buildings erected prior to 1900 are "old law" dumb-bell tenements of four or five stories, "railroad tenements", and converted brownstone houses used as tenements.

The map of Predominant Age of Residential Buildings, Figure 53, shows that growth has been gradually outward, with the newer areas progressively further from the center. There are, however, exceptions such as the long-established villages of Queens, The Bronx, and Richmond, which existed many years before the consolidation of the city. Queens, in many respects the newest of the boroughs, has developed over 50 percent of its residential blocks since 1924. In studying the Age Map, it is important to bear in mind that many areas have been only partially developed, often years ago, and that more recent construction has been done in other newer neighborhoods. Thus, we have districts of twenty and thirty-year old residences interspersed with vacant lots. Such vacant lots are generally not attractive as locations for new modern homes, as these new homes would suffer by proximity to houses that date from an earlier building epoch.

Residential Rentals

Analysis of rentals, as recorded by the Real Property Inventory in 1934, reveals that New York is primarily a city of the great middle-income stratum of human society. Figure 54. Sixty percent of the blocks exhibit predominant rentals of \$30 to \$59 per family quarter per month. Figure 54. Only 8.4 percent of the blocks are above \$60 in rent, and about the same proportion fall at the bottom of the scale, below \$19 per month. The proportion of middle-income families runs fairly close to the city average in every borough except The Bronx, which has 81 percent, and Manhattan, which has 36 percent of the blocks in this group.

HOW N.Y.C. USES ITS RESIDENTIAL AREA.



PREDOMINANT TYPES OF HOUSING AS DETERMINED BY THE
MAYOR'S COMMITTEE ON CITY PLANNING
FROM INFORMATION COLLECTED BY THE REAL PROPERTY INVENTORY-1934

WPA PROJECT 05-97-319X
MAY 1934

FIG. 50

MAYOR'S COMMITTEE ON CITY PLANNING THE CITY OF NEW YORK

FIORIELLO H. LA GUARDIA
MAYOR



TIMOTHY J. SULLIVAN
CHAIRMAN

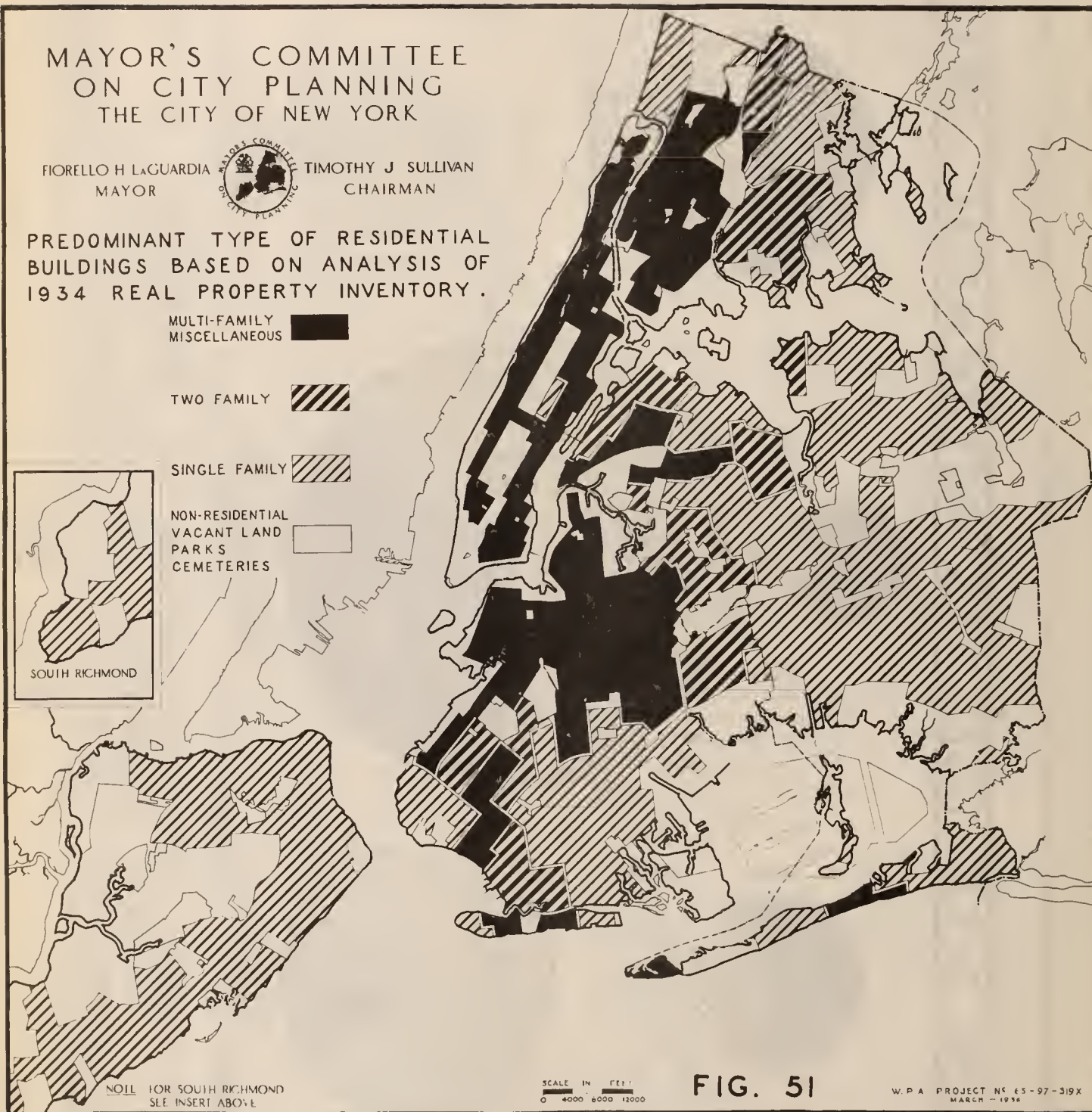
PREDOMINANT TYPE OF RESIDENTIAL
BUILDINGS BASED ON ANALYSIS OF
1934 REAL PROPERTY INVENTORY.

MULTI-FAMILY
MISCELLANEOUS

TWO FAMILY

SINGLE FAMILY

NON-RESIDENTIAL
VACANT LAND
PARKS
CEMETERIES



NOTE: FOR SOUTH RICHMOND
SEE INSERT ABOVE

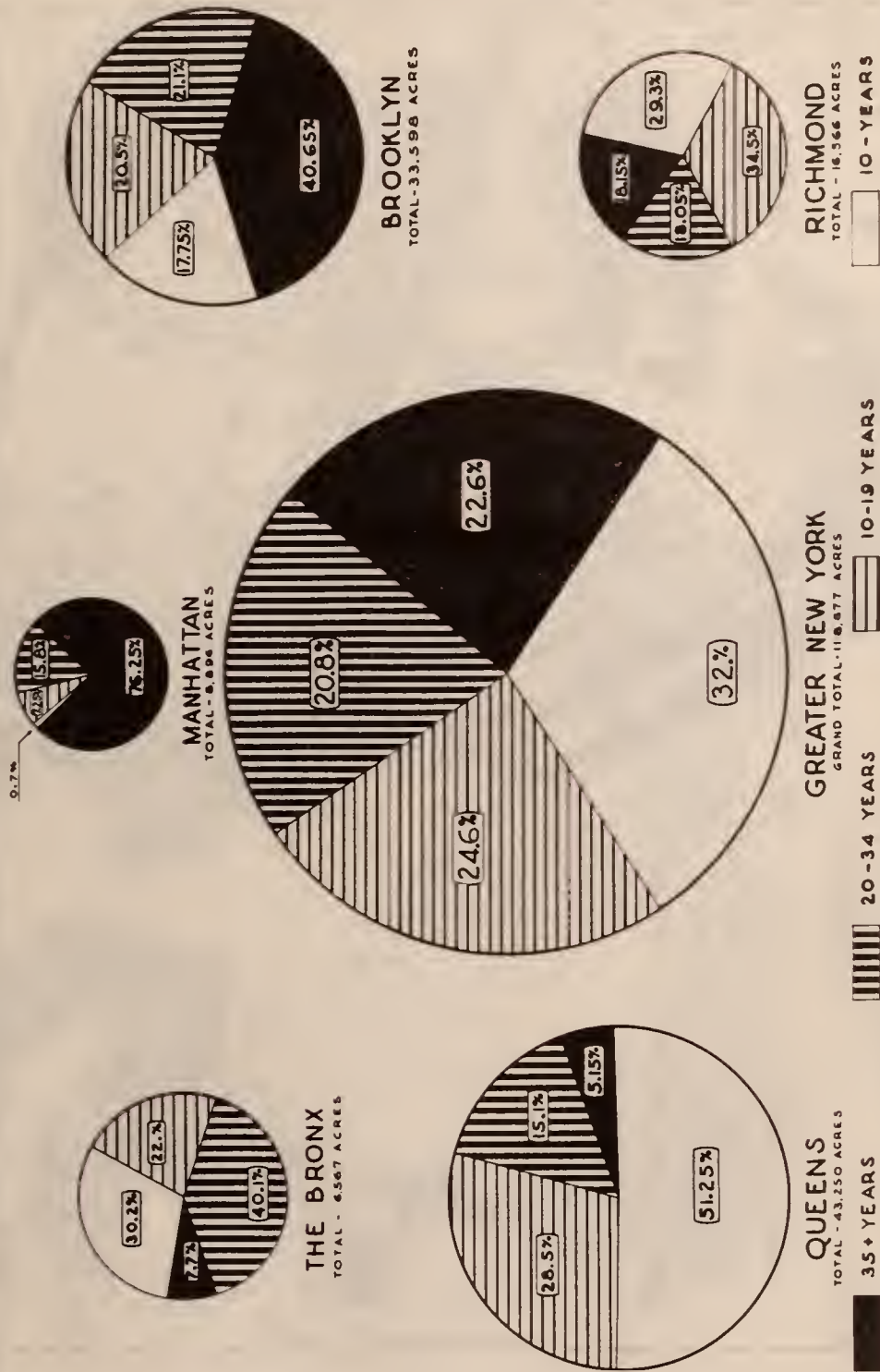
SCALE IN FEET
0 4000 8000 12000

FIG. 51

W.P.A. PROJECT NO. 65-97-319X
MARCH - 1936

AT 60840

AGE OF RESIDENTIAL AREAS IN N.Y.C.



PREDOMINANT AGE OF HOUSING AS DETERMINED BY THE
MAYOR'S COMMITTEE ON CITY PLANNING
FROM INFORMATION COLLECTED BY THE REAL PROPERTY INVENTORY-1934

W.P.A. PROJECT #5-97-3191

FIG. 52

MAYOR'S COMMITTEE ON CITY PLANNING THE CITY OF NEW YORK



FIORIELLO H. LAGUARDIA
MAYOR

TIMOTHY J. SULLIVAN
CHAIRMAN

SCALE IN FEET
0 1250 2500 5000

APRIL - 1936

PREDOMINANT AGE OF RESIDENTIAL BUILDINGS BASED ON ANALYSIS OF 1934 REAL PROPERTY INVENTORY

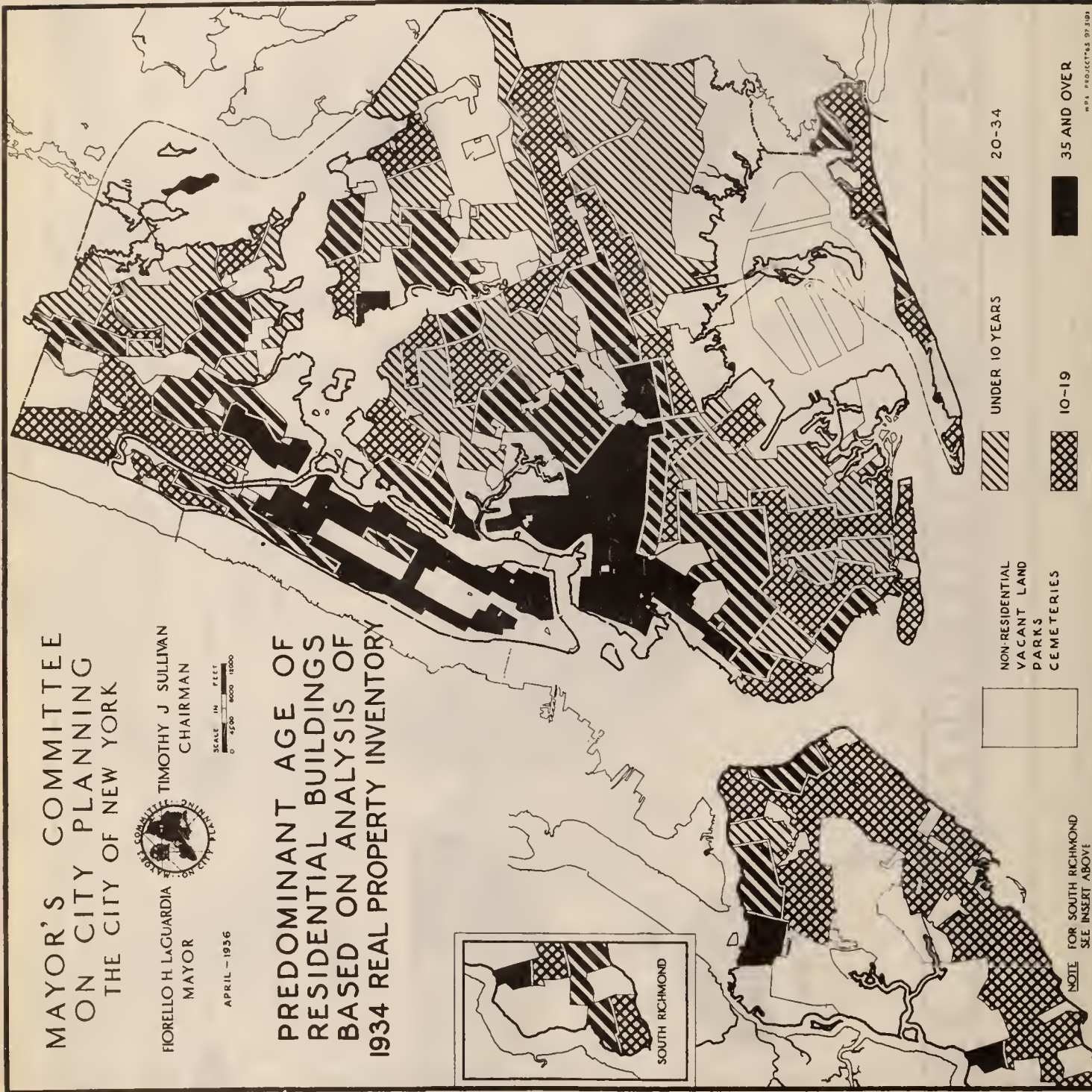
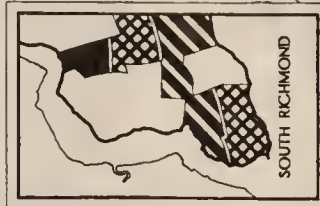
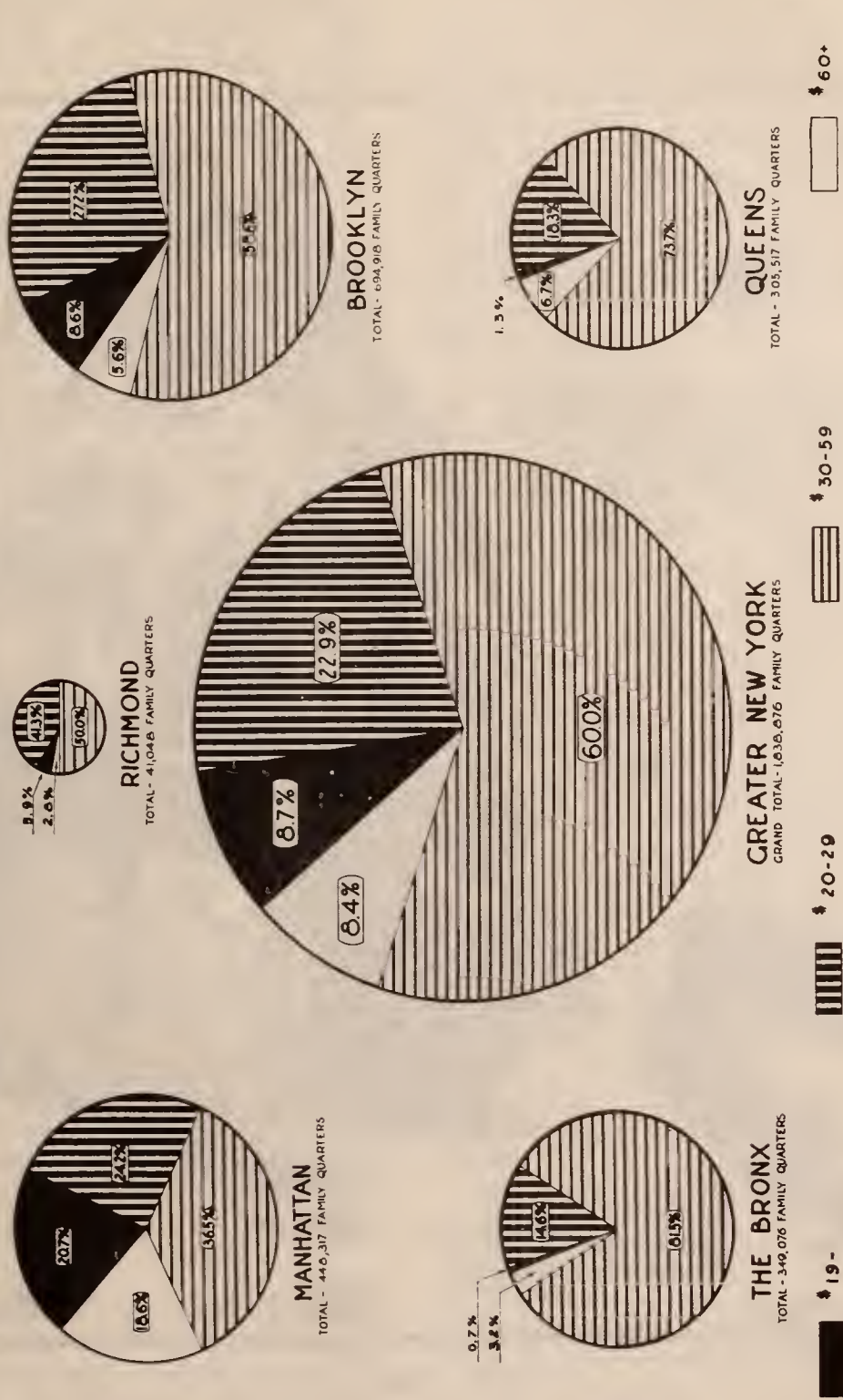


FIG. 53

• RENTALS IN NEW YORK CITY •



RENT PER FAMILY QUARTER PER MONTH AS DETERMINED BY THE MAYOR'S COMMITTEE ON CITY PLANNING FROM INFORMATION COLLECTED BY THE REAL PROPERTY INVENTORY-1934

WPA PROJECT # 65 97 517X
APRIL 1940

FIG. 54

MAYOR'S COMMITTEE
ON CITY PLANNING
THE CITY OF NEW YORK

FIORIELLO H. LAGUARDIA
MAYOR



TIMOTHY J. SULLIVAN
CHAIRMAN

PREDOMINANT RENTALS
OF RESIDENTIAL BUILDINGS
BASED ON ANALYSIS OF
1934 REAL PROPERTY INVENTORY

APRIL - 1936

SCALE IN FEET
0 4000 8000 12000

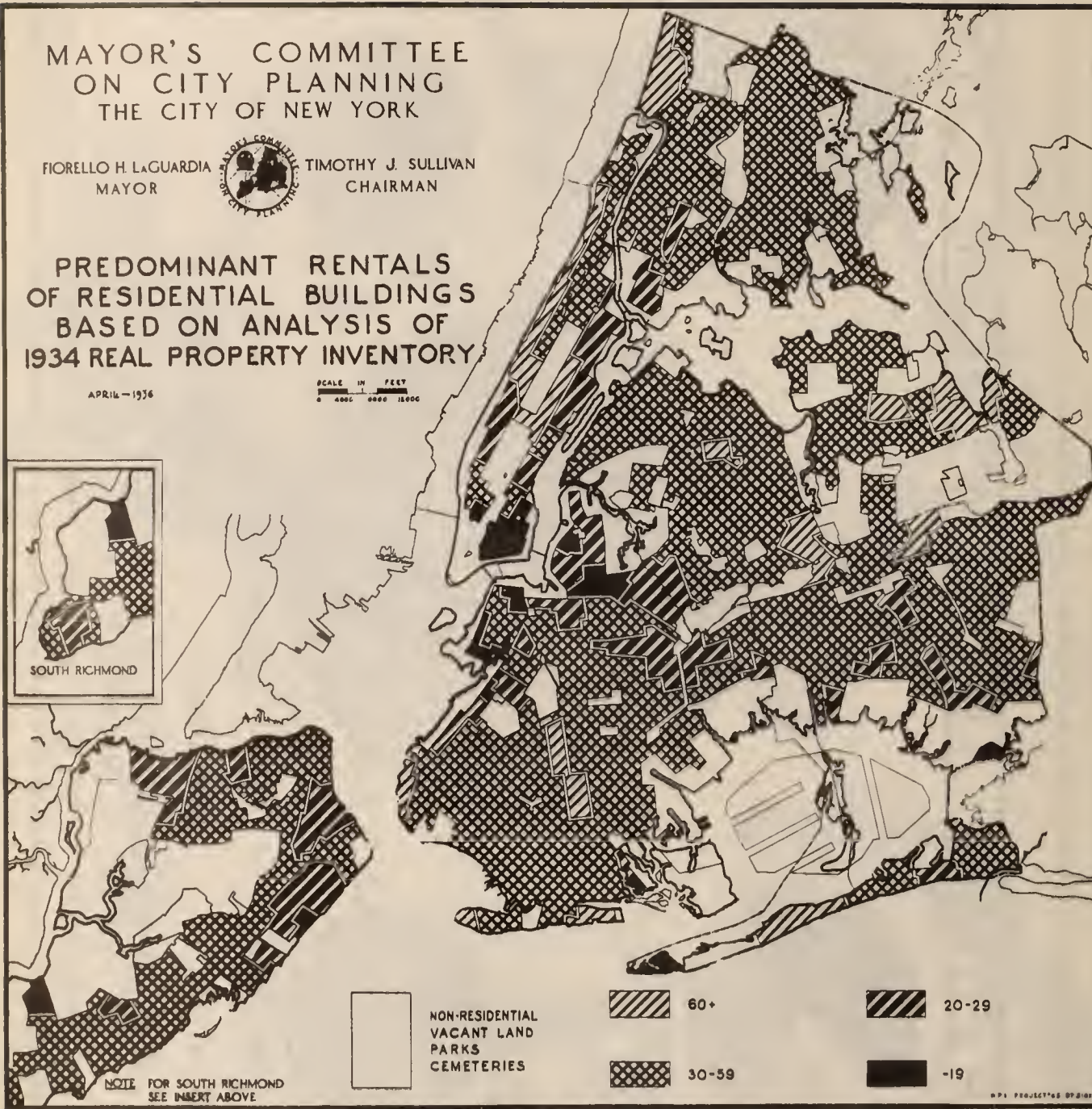


FIG. 55

Manhattan exhibits more of the extremes of high and lower income, with 20.7 percent of the blocks showing rents above \$60, and 18.6 percent below \$19 per family quarter per month. The proportion of the extremes in The Bronx, Queens and Richmond is, in comparison, almost negligible.

The lower medium rental bracket, \$20 to \$29, ranges from 18.3 percent in Queens to 41.3 percent in Richmond, with Manhattan at 27 percent, and the city average about 23 percent. Figure 54.

The rental map, Figure 55, shows a uniform pattern of medium rent areas, with small, almost isolated areas of high and low rent. Manhattan is particularly interesting, with its patchwork distribution of the four rental classifications.

If equally complete rent statistics were obtainable for 1937, the charts and maps would probably show a slightly larger proportion of blocks in the top rent bracket and somewhat less in the bottom group. The preponderance of blocks in the \$30 to \$59 group would, perhaps not be altered very much one way or the other.

Residential Building Condition and Percentage of Vacancies

The colored maps showing condition of buildings and extent of vacancies were not subjected to the same analysis that was done in the case of the age, type and rent maps just described. "Condition" is an abstract term, rather difficult to define. It is therefore susceptible to various interpretations by different canvassers, which makes the reports more difficult to analyze on a uniformly standard basis.

The range of vacancies, revealed by the block analysis of the Inventory, varied greatly within comparatively small areas. Consequently it was impractical to define boundaries of areas within which reasonable uniformity could be said to prevail. For a district lying within any set of boundaries, the precise percentage of vacancy could, however, be calculated from the Real Property Inventory data. This was subsequently done for the Study Areas described in a later section of this chapter.

Problem Areas

Very few people have any accurate or detailed knowledge of every section of the city. Most of the inhabitants know only the streets and hardly anything of what lies behind the miles and miles of building fronts. As a first step toward presenting an analytical picture of residential New

York, the staff made groupings of related characteristics shown on the original color maps.

These groupings were then shown on a separate map, at a scale of 2,000 feet equals one inch, and thereafter the gross acreage was measured for each group. The Predominant Non-Residential areas were placed in one group, Vacant Lots and Blocks in another, large Parks and Cemeteries were placed in separate groups, and the Predominant Residential areas were divided into *Stable*, *Intermediate*, and *Problem* Areas according to the following criteria. This treatment served to highlight the areas requiring careful study and, at the same time, to demarcate areas that appear to be without relatively serious problems.

Residential sections containing blocks in which the predominant monthly rental exceeded sixty dollars per dwelling unit, with buildings ten years of age or less, were considered "Stable Areas". At the opposite end of the scale were Areas where the predominant rents were below thirty dollars per family quarter per month, and predominant age of dwellings exceeded thirty-five years. In the latter type of Area it was assumed that unstable social, economic and physical conditions were apt to prevail, and such sections were termed "Problem Areas". The great mass of residential blocks, containing buildings between ten and thirty-five years of age, and predominant monthly rentals ranging from thirty to fifty-nine dollars per family quarter, fall between these two extremes and were termed "Intermediate Areas".

The original Area Characteristics Map was in color and unfortunately does not lend itself to effective reproduction at small scale. The gross acreage as planimetered for each of the groups shown on this map are, however, indicated by the ratios given in Table 12.⁽³²⁾ Reference to this table will reveal that nearly one-third of Manhattan's, about one-twentieth of The Bronx's, one-fifth of Brooklyn's, under 4 percent of Queens', and 11 percent of Richmond's predominant residential areas appear to be "Problem Areas".

Special study was given to the "Problem Areas" to determine the extent of possible large-scale renovation. Where this does not appear worthwhile, and when there is no reasonable prospect for commercial or industrial use, the alternative might be eventually to demolish the buildings and replan the areas for new well-designed housing of

(32) The acreage figures for Non-Residential Areas were measured on a 2,000-foot scale map and therefore vary somewhat from the more precise measurements given in Table 20—Land Uses in Predominant Non-Residential Areas—1936.

TABLE 12
Predominant Area Characteristics By Percent of Gross Acreage in Each Borough—1934
(Based on Analysis of Real Property Inventory Block Maps)

Predominant Characteristics	Manhattan	Bronx	Brooklyn	Queens	Richmond
Non-Residential Areas	22.9	11.6	10.9	7.9	8.0
Vacant Land	..	13.6	8.5	25.2	51.0
Parks	14.1	15.1	7.5	4.8	7.0
Cemeteries	0.1	1.7	1.9	2.9	1.5
Residential Areas					
Stable	12.0	13.8	13.0	18.8	3.7
Intermediate	21.2	39.1	37.3	36.9	17.8
Problem	29.7	5.1	20.9	3.5	11.0
Totals	100.0	100.0	100.0	100.0	100.0

high, medium, or low rent, as may best fit each location; or alternatively, devote the land to some quite different purpose.

Between the "Stable Areas" and the "Problem Areas" lies a wide range of residential neighborhoods where the age and rent factors do not yield obvious or clear-cut conclusions. These areas evidently could not be evaluated without recourse to additional factors. It was their indeterminate character, as judged solely by the criteria based on the Real Property Inventory data, that led the staff to develop a more detailed and penetrating method of analysis, which is described in a later section of this chapter.

RESIDENTIAL STUDY AREAS

What is the most appropriate use of property in a particular residential district; where are the more desirable places to build a specific type of house? No matter how the problem is stated, the answers must come from thorough studies of all areas and all types of housing. One of the more important services that can be rendered by city planning is the indication of the most desirable uses of all privately owned land.

The property-owners, the government and the people of New York, and most other cities, have suffered from lack of guidance as to *where* and *what* to build. Improperly chosen and poorly located types of residential building have often been erected. As a result, owners have lost their equity, investors have lost both income and capital, and the city has had to pay for expensive public improvements, installed to make the developments livable. Tenants have suffered from

excessively long travel-time to their work, combined with insufficient local facilities, amenities and advantages that a beneficent city government was powerless to provide.

This is quite briefly the picture of plan-less city growth; without proper guidance or the full knowledge wherewith to guide; without reasonable control or the understanding that such control was badly needed. The mistakes of the past can be corrected in part, but only after a long period of time. It would be inexcusable, however, to stand by and to watch the same mistakes repeated in the future. To a considerable extent, further mistakes may be prevented by wise planning, and zoning to control the location and type of building construction, and to guide land uses in general.

Careful examination of the present zoning law will reveal that the map and ordinance furnish an imperfect expression of where and what to build. Notable deficiencies—such as excessive districts for business and for apartment houses, and lack of protection for neighborhoods of single-family homes—are discussed in the Zoning chapter of this volume. To determine how such short-comings may be corrected, how Zoning may be made a true guide to residential growth, it is essential to ascertain the facts, and then determine how each separate district and neighborhood may best face its indicated future.

The empirical study of the original color maps, described above, shows the stable and relatively unstable sections of the city as indicated by an examination of Real Property Inventory data. The resulting map showing "Problem Areas" does not, however, produce a pattern for future resi-

dential development. The block analysis and mapping of the Real Property Inventory, described above, furnished the primary foundation for comprehensive studies which attempted to define a sound pattern of residential development that would properly house the city's future population.

Selection of Areas

As a first step in this investigation, it was necessary to formulate criteria which would determine areas of suitable size for study. One of the more obvious bases for such selection is homogeneity of certain characteristics. Within the limitations of the data at hand, it was decided to classify the predominantly residential areas of the city according to the type, age and condition of residential buildings and the rental paid. Superimposing the four original color maps, the staff identified a series of areas in each borough which were substantially homogeneous with respect to type, age and condition of residential buildings and monthly rental. A map of major streets was then used to further divide homogeneous areas, so that in all 725 of these study areas were demarcated, divided as follows: Manhattan 76, Brooklyn 154, The Bronx 123, Queens 257, and Richmond 115 study areas. These study areas cover a variety of residential districts, ranging from the new single-family home area of high rents to the "old law" tenement area with rents under \$19 per family per month, and buildings in very poor condition. Some of these study areas are in predominantly residential areas of the city which were substantially unimproved and vacant.

Supplementing Real Property Inventory Data

Determination of the future residential pattern of a city as large and complex as New York involves both analysis and synthesis. The whole is the sum of the parts, and an accurate measure of the whole depends upon detailed study of the parts, each considered as a separate entity and in its relation to the framework of the entire city.

Before attempting further analysis of these 725 study areas, the staff attempted to learn as much of each area as possible. Such information as would contribute to an understanding of current conditions, trends and future potentials was obtained from secondary sources and tabulated. The extent of this information is indicated by Figure 56, but two kinds of data require special mention, namely, tax arrears and building activity.

Tax Arrears

In New York State the real property tax is a charge against the land, running with the land, and when not paid accumulating as a lien against it. If the property is mortgaged, the mortgagee, to protect his investment, will normally pay the taxes if the owner does not. If the property is a bad investment to be written off, or an unhappy speculation, both the owner and mortgagee (if any) may default the taxes and allow a tax lien to be sold at auction. These liens may find no private bidder, in the case of the poorest properties, and are perforce acquired by the city. The proportion of city-owned tax liens in any given area is thus a measure of the extent and severity of past mistakes and of prevailing judgment as to future prospects.

The staff prepared maps showing all properties under lien to the city, and the relative length of years that the liens had been held. As would be expected, the areas with the largest number of liens are those far from transit. Acreage in such areas has been cut up into small building plots that were sold to speculative-investors, and ownership thus shifted generally from strong to weak hands.

The maps bring another entirely different type of area into relief, namely, the decrepit tenement neighborhood. In such areas, many buildings are generally dilapidated, have high vacancies and command such low rents that taxes and mortgage interest can seldom be met promptly or in full. As a result, the landlords may reach an abyss of indecision, and feel that no further investment would be prudent, even if money were forthcoming.

These tax-arrears maps were a valuable tool in appraising the present status and public opinion concerning a great number of areas, which in varying degree have a clouded future. It was not feasible, however, to reproduce these maps at the small scale necessary in this report. The worst of these areas are in general to be avoided for future building of the types for which they were originally planned; but may offer excellent—often surprising—opportunities for some quite different purpose. Large areas of tax-lien vacant lots could be foreclosed by the city and assembled as a park, or replotted and sold for farm or institutional purposes. Tax-lien tenements in congested areas can similarly be foreclosed and torn down to provide breathing-space playgrounds, or to permit neighborhood rehabilitation.

Recent Building Activity

During the depression years when mortgage money was scarce, where did residential building continue to go forward? Certainly not in areas of doubtful future stability but rather where all conditions were so favorable that a long-term investment was considered safe. Where are these areas that lending institutions, specializing in real estate, view as sound?

To answer this question quantitatively and in terms of the combined consensus of expert opinion, the staff plotted every building for which a permit was issued from 1934 to 1937. Where the "permit" spots cluster on the map (and provided other factors give confirmation), there is evidence of belief in an assured future. These are "coming sections" in which faith gives some assurance of hope.

Study Area Correlation Form

The data obtained from analyses of the Real Property Inventory, tax arrears, recent building activity and other supplementary information from various staff studies were then tabulated for each study area on a special form. A copy of this form, here reproduced as Figure 56, gives the precise scope and detail of the data compiled. These completed forms give in effect a description of the area as it exists, plus indications of its comparative prospects in relation to other residential areas.

RESIDENTIAL AREA ANALYSIS

An investigation was made to ascertain the conditions under which various types of residential development normally take place and flourish. Practically all of the assumptions were checked against actual conditions in the field. In addition, the staff had the advantage of discussing the various steps with recognized economic and planning experts, who made valuable suggestions concerning the aspects of the study related to their respective fields. As a result of this investigation, a tabulation was prepared giving the quantitative factors which were believed sound in determining preliminary conclusions as to the desirable future use of residential areas.

Analysis Factors

It is not within the scope of this report to discuss each of the factors listed in Figure 57, with an explanation of the limits chosen for each of the

twelve types of residential area. The fixing of these limits was, however, subjected to thorough scrutiny and the factors selected are believed to be entirely reasonable, and sound indicators of future prospects. For example, if an area is suitable for demolition of existing residential buildings, combined with extensive new construction of low rent housing, the present buildings must be obsolete and the land cost relatively low, nor must rents be high. There should be five-cent transportation within easy reach and the opportunity for residents with low income to walk to work. Parallel lines of reasoning apply to the other factors.

For a more detailed illustration, line 11 of Figure 57 gives the following criteria for areas deemed most suitable for future development with higher rent garden apartments:

- A present gross density per acre of less than 100 persons;
- Future densities up to but not exceeding 200 persons;
- No serious invasion by heavy traffic;
- Nearly all streets paved;
- Rapid transit running times of from 20 to 35 minutes, or surface feeders to rapid transit, or railroad service;
- Not more than 6 percent of the land area in non-residential use;
- Few workers employed in the area, ratio of 25 to 50, plus, residents to each worker;
- Practically complete sewer and water facilities;
- Large proportion of residential zoning;
- Low lot coverage under zoning restriction, C to E Area districts;
- Dominantly multi-family residences, if any present development;
- Large amount of vacant space, 1 to 70 percent of vacant blocks and vacant lots;
- Relatively new buildings, 10 to 34 years;
- Existing buildings in relatively good condition, "Condition 1 or 2";
- Higher than average rents, \$60 or more per family per month;
- Low traffic accident rate, not more than 2 per block;
- Assessed land values within the range of \$0.48 to \$7.60 per square foot, preferably in the lower ranges;
- Moderate tax arrears, 0 to 3 per block; and
- Some substantial advantages for residential purposes, but no serious disadvantages.

A comparison of the data on the sample form "A-4", Figure 56, with the above criteria will show why area "K-110" was found suitable for a high rent "garden" type apartment development.

Analysis Procedure

The analysis of 725 study areas on the basis of the variable factors given in Table 57 presented many technical problems. In order to facilitate the work of a large staff, and to remove the element of individual judgment, a unique procedure

was devised for the Residential Area Analysis. A special "checkerboard" form was prepared on which every factor shown in Figure 57 was listed. Opposite the separate factors there appeared a series of spaces each of which was assigned a specific weight, or range of values, corresponding with the degree of information shown in Figure 57 for each factor. On copies of this form the appropriate weights for all factors were indicated in red crayon so that it was possible to ascertain at a glance the characteristics of any study area by reference to its "checkerboard" form.

The next step in this procedure involved the preparation of a "mask" for each of the twelve types of residential development. The several factors with the range of values or weights applicable to each type of development were perforated so that the "mask" for any Conclusion, when placed over the special "checkerboard" form, revealed only those characteristics used to determine that particular Conclusion. Thus the procedure involved the matching of masks against checkerboards.

For example, mask 1 was designed so that, when superimposed over a checkerboard form, only those factors given in Figure 57 which lead to Conclusion 1, namely *One-Family Detached Houses, High Rent Value*, were visible.

With the checkerboards and masks the staff readily arrived at "preliminary conclusions", including both primary and secondary incidence whenever the factors indicated that more than one type of development would be suitable for a study area. The staff findings were carefully checked in all cases where the characteristics of an area did not indicate a fairly clean-cut conclusion.

In arriving at the Residential Conclusions, certain factors were weighted more heavily than others. In the case of zoning, the Use and Area districts shown on present maps were not given undue consideration. In a great many instances it was found that the existing zoning Use districts are by no means consistent either with the present or the prospective character of neighborhoods. A large number of definitely residential neighborhoods are now zoned for business or unrestricted Use; and one-family developments frequently occur in C and D Area districts.

It was also found that large sections of the city are inadequately supplied with park and playground facilities, but otherwise appear to be well suited for residential growth.⁽³³⁾ Progress in pro-

viding new parks and playgrounds has been rapid during the last few years, but there still remains a great deal to be done.

In arriving at a specific type of residential development as the considered conclusion most applicable to a particular area, it is not intended that the recommendation be construed as the only logical use to which the area should be devoted. Rather, it represents the most favorable type of use, all factors considered, in relation to the rest of the city. Parts of areas, and particularly their borders, might be used in some other way not fundamentally inconsistent with the principal recommendation. Where more than one kind of development appeared logical because of a mixture of uses or overlapping of indications, the area was assigned both a *primary* and a *secondary* recommendation. As mentioned above, such findings were necessarily reached as more completely reflecting the factors underlying this study. Every effort was made to secure reasonable homogeneity of the study areas, but there are many sections of New York where homogeneity does not exist entirely—even if areas as small as a single block are considered. In a large number of the residential study areas, there is, and perhaps there should continue to be, a range of rentals and some variety of building types.

RESIDENTIAL CONCLUSIONS

The following sections of this chapter describe the extent and location of the twelve types of residential development found suitable for the 725 study areas. The incidence of each classification is given by boroughs in Table 13, and the geographical distribution is shown graphically on the accompanying maps, Figures 58 through 69, with demarcation of both primary and secondary incidence.

The staff believes that the method adopted for evaluating the most suitable future uses of residential areas is fundamentally sound. The conclusions should prove a valuable guide to public officials in their determination of policy in initiating large scale improvements which involve the expenditure of public funds. The recommendations should also be of special interest and of value to private real estate developers and purchasers of homes.

In viewing these conclusions, it is important to remember that they are not based merely upon 1934 conditions. The determining factors also take into account the character and extent of current trends, future needs, and probable economic

(33) See the chapter entitled "The Park System" in *City-Wide Studies, Part II, The Planning of Public Services for the City of New York*.

TABLE 13
Percentage Distribution of Residential Conclusions By Boroughs and For the City
(Adjusted for Primary and Secondary Conclusions)

Indicated Future Use	Manhattan	Bronx	Brooklyn	Queens	Richmond	N. Y. City
1. Single-Family High Rent	...	10.0	5.1	13.8	2.2	8.0
2. Single-Family Medium Rent	...	16.4	17.9	36.3	46.7	29.5
3. Two-Family	...	17.7	15.4	7.1	1.6	8.8
4. Unripe and Impractical	...	11.1	10.0	24.5	33.2	19.7
5. Prematurely Developed	...	2.9	0.2	5.9	15.8	5.9
6. Declining Residential	5.4	0.4	0.4	2.5	...	1.4
7. Rehabilitation	18.3	4.4	10.9	*	...	4.2
8. Demolition and Low Rent Housing	22.7	0.1	5.2	0.2	...	2.7
9. High Rent Apartments	22.9	...	0.6	...	...	1.6
10. Medium Rent Apartments	30.7	29.8	25.6	1.9	0.4	12.4
11. High Rent Garden Apartments	...	3.2	4.3	1.6	0.1	2.0
12. Medium Rent Garden Apartments	...	4.0	4.4	6.2	...	3.8
Total Percent	100.0	100.0	100.0	100.0	100.0	100.0

*Less than one-tenth of one percent.

demand. There will be some difference of opinion among competent judges as to the nature and limitations of the factors used in determining these conclusions. The residential findings establish, however, a scale of relativity between the twelve classifications and the areas to which they apply. After a critical examination of the factors and the results, it will be obvious that changes in the quantitative values of the criteria would merely shift the findings up or down a comparative scale of conclusions.

One-Family Detached Homes—High Rent

The areas that offer the best opportunities for development with single-family houses of good quality and above average rent are found in this category. These houses normally occupy lots with at least 50 feet of frontage, and will lease for more than \$60 per month. The classification also includes a few areas that have been developed with large private estates of one acre or more.

The areas have been selected, for the most part, because they already predominate in well kept-up one-family houses, and have attractive locations that will tend to encourage further growth. In general, old areas have not been placed in this category. New detached homes of modern type are seldom a logical development in neighborhoods

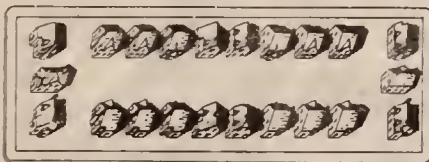
where most of the buildings are over twenty years old.

Most of the single-family areas placed in Conclusion 1 are either within one-half mile of a rapid transit station or accessible to a railroad station. They have adequate paved streets and a reasonable percentage of streets served by sewer and water lines. See Figure 58. The principal neighborhoods placed in this classification are Forest Hills, Flushing and Jamaica in Queens; Riverdale in The Bronx; and Flatbush in Brooklyn.

One-Family Homes—Medium Rent

Large sections of the city have developed with small one-family homes within the means of families of modest income. Many other areas, judged by present trends of growth, will probably develop along similar lines. Lots not less than 37½ feet wide would be typical of what is believed suitable for these sections. In some of these areas, however, there has been a great deal of construction on smaller lots which produces unnecessary overcrowding of the land. Rents, or the equivalent for owner-occupied homes in this type of development, would range from \$30 to \$70 per month. The areas are either close to existing places of work or within easy walking distance of a bus line leading to a rapid transit station. A

PRELIMINARY CONCLUSIONS AS TO RESIDENTIAL AREAS



ONE FAMILY DETACHED HOMES-HIGH RENT VALUE

PRIMARY SECONDARY PREDOMINANT NON-RESIDENTIAL

SCALE
0 4000 8000 12000
SEPTEMBER-1936

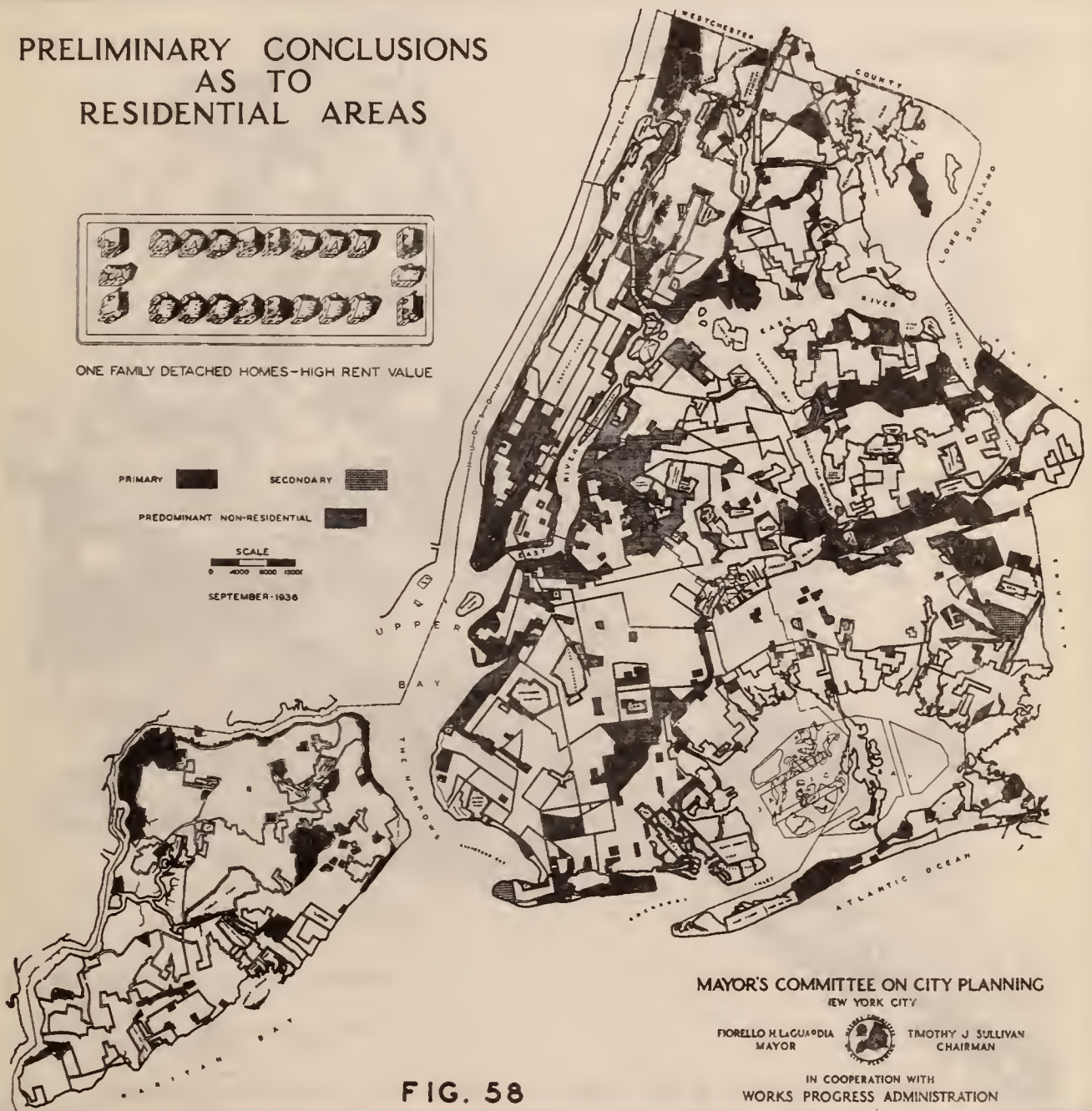


FIG. 58

MAYOR'S COMMITTEE ON CITY PLANNING
NEW YORK CITY

FIORELLO H. LA GUARDIA
MAYOR

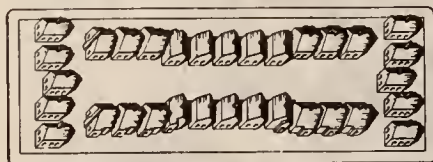


TIMOTHY J. SULLIVAN
CHAIRMAN

IN COOPERATION WITH
WORKS PROGRESS ADMINISTRATION

U.S. D.P.A. PROJECT NO. 148-107-5407

PRELIMINARY CONCLUSIONS AS TO RESIDENTIAL AREAS



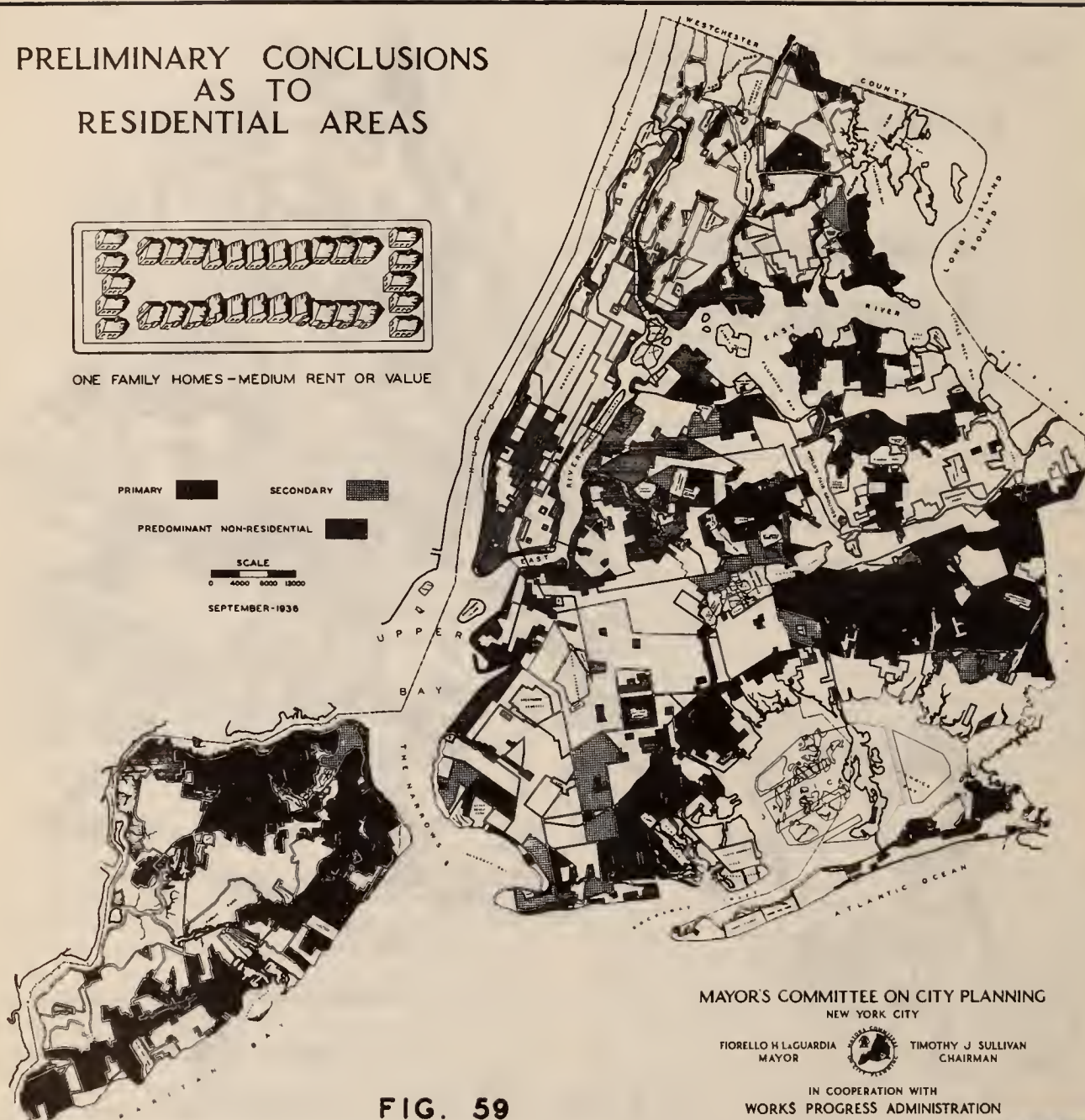
ONE FAMILY HOMES—MEDIUM RENT OR VALUE

PRIMARY SECONDARY

PREDOMINANT NON-RESIDENTIAL

SCALE
0 4000 8000 12000

SEPTEMBER-1936



MAYOR'S COMMITTEE ON CITY PLANNING
NEW YORK CITY

FIORIELLO H. LA GUARDIA
MAYOR

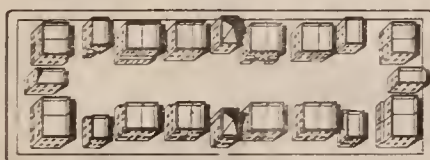


TIMOTHY J. SULLIVAN
CHAIRMAN

IN COOPERATION WITH
WORKS PROGRESS ADMINISTRATION

FIG. 59

PRELIMINARY CONCLUSIONS AS TO RESIDENTIAL AREAS



TWO FAMILY DWELLINGS

PRIMARY SECONDARY PREDOMINANT NON-RESIDENTIAL

SCALE
0 4000 8000 12000

SEPTEMBER-1936

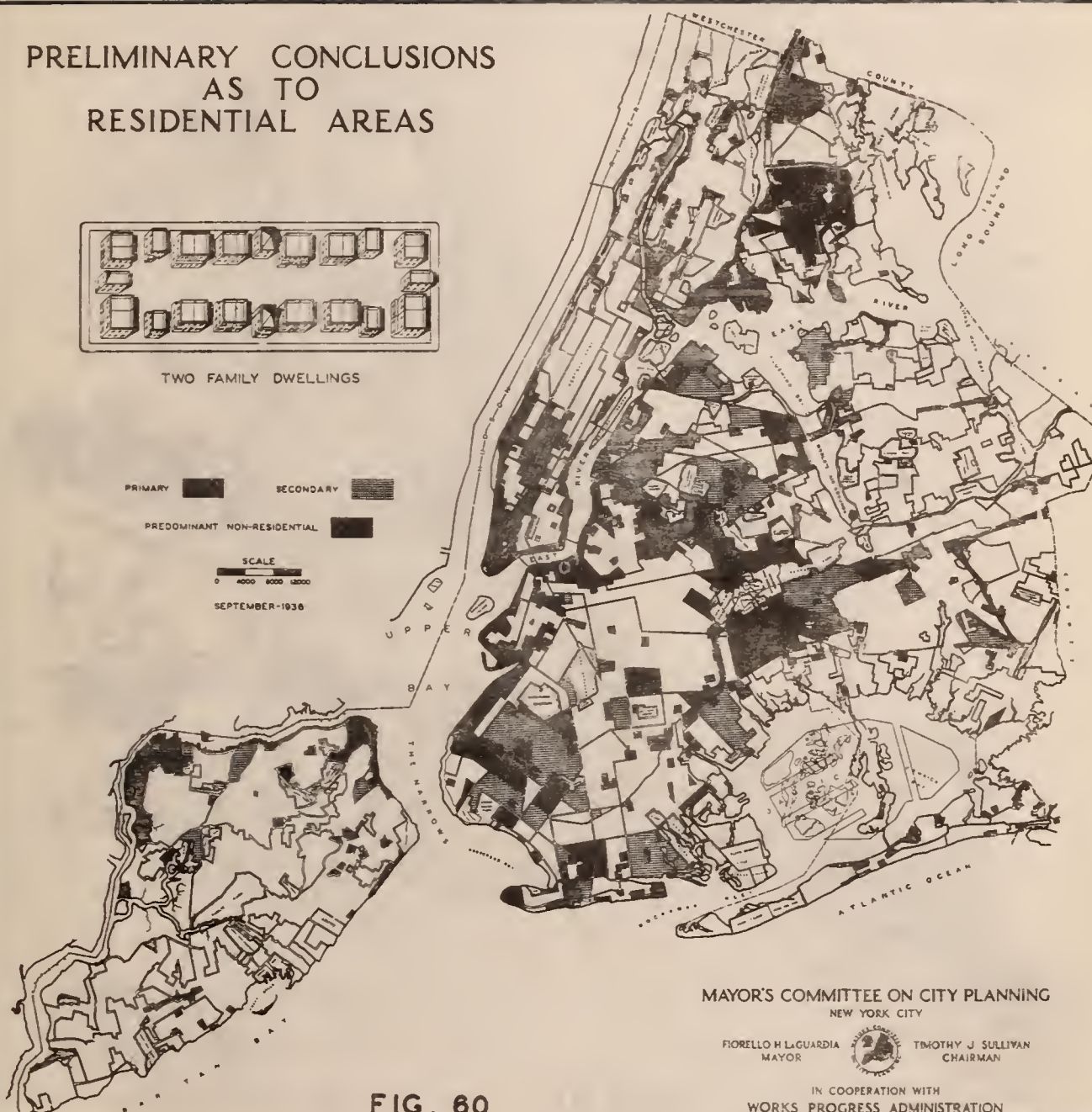


FIG. 60

MAYOR'S COMMITTEE ON CITY PLANNING
NEW YORK CITY

FIORELLO H. LAGUARDIA
MAYOR



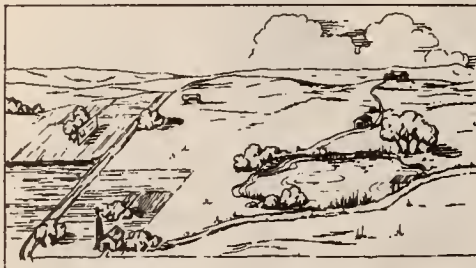
TIMOTHY J. SULLIVAN
CHAIRMAN

IN COOPERATION WITH
WORKS PROGRESS ADMINISTRATION

GENERAL PROJECT NO. 100-27-6007
SPECIAL INVESTIGATION OF THE CITY OF NEW YORK

1936-1937

PRELIMINARY CONCLUSIONS AS TO RESIDENTIAL AREAS

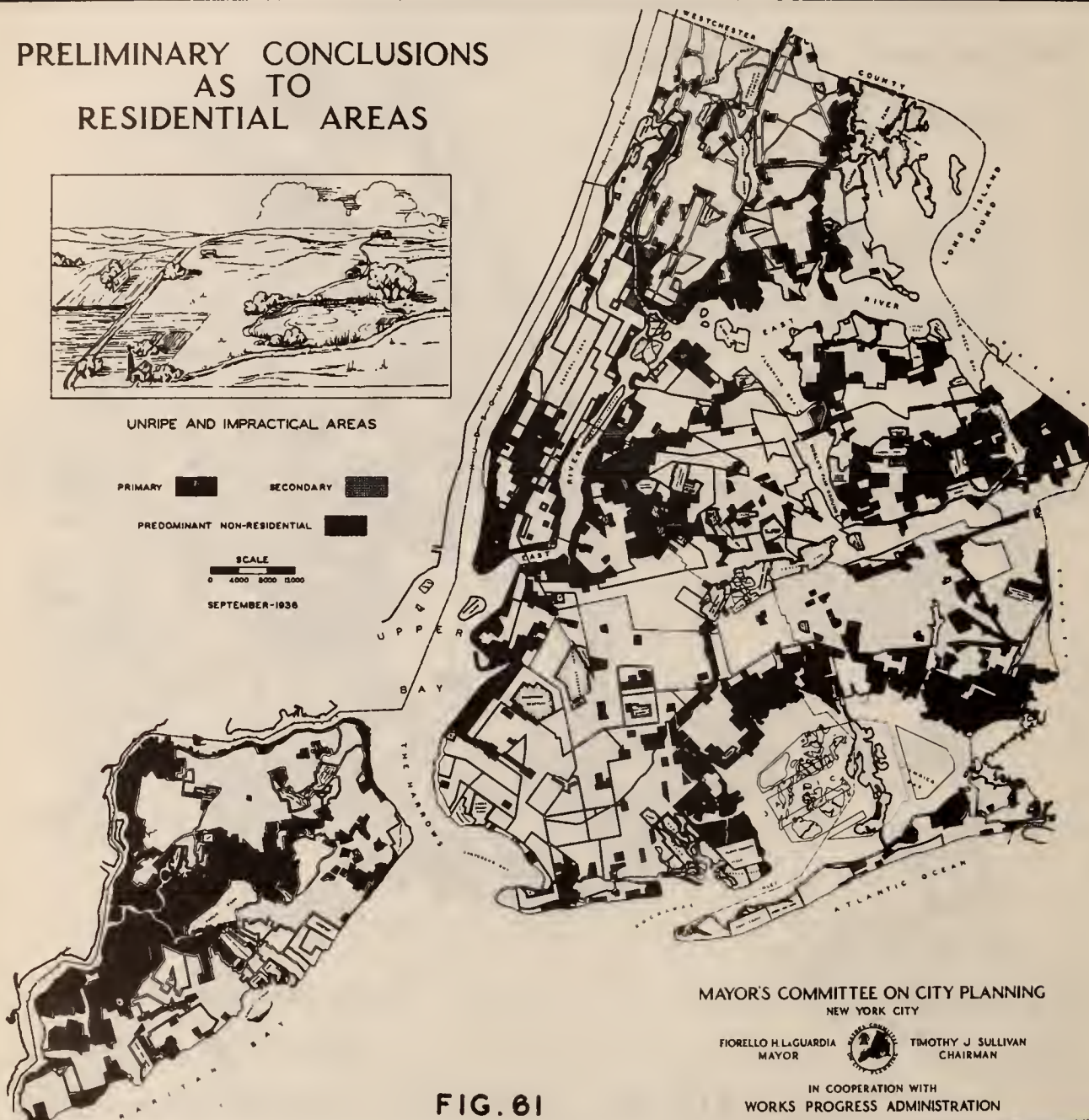


UNRIPE AND IMPRACTICAL AREAS

PRIMARY  SECONDARY 
PREDOMINANT NON-RESIDENTIAL 

SCALE
0 4,000 8,000 12,000

SEPTEMBER-1936



MAYOR'S COMMITTEE ON CITY PLANNING
NEW YORK CITY

FIORIELLO H. LA GUARDIA
MAYOR



TIMOTHY J. SULLIVAN
CHAIRMAN

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FIG. 61

U.S.W.P.A. PROJECT NO. 100-17-6057
DRAWN BY: J. H. B. 10/1/36
221 50004

TABLE 14
Estimated Average Population Density Assigned to Study Areas By Residential Conclusion

Indicated Future Use	Bases for Estimate (1)	Density (2)
1. Single-Family High Rent	Lots 50' front, plus; streets 25 to 32%	19
2. Single-Family Medium Rent	Lots 37½' front, plus; streets 25 to 32%	27
3. Two-Family	Lots 37½' front, plus; streets 25 to 32%	48
4. Unripe and Impractical	(No population assumed)	0
5. Prematurely Developed	(Population assumed static)	(1934)
6. Declining Residential	(No population assumed)	0
7. Rehabilitation	(Population assumed static)	(1934)
8. Demolition and Low Rent Housing	25% cover, 4-story buildings; super blocks	190
9. High Rent Apartments	50% cover, 6 to 10-story buildings; grid. streets	290
10. Medium Rent Apartments	40% cover, 5-story buildings; grid. streets	230
11. High Rent Garden Apartments	25% cover, 4 to 6-story buildings; super blocks	160
12. Medium Rent Garden Apartments	25% cover, 4-story buildings; super blocks	145

Note: (1) These estimates also assume: three and one-half persons per family; five percent vacancy for Conclusions 1, 2 and 3; continuance of 1934 occupancy ratios for Conclusions 5 and 7; ten percent vacancy for Conclusions 8, 9, 10, 11 and 12; and for a proportion of gross area used for streets, which accords with experience in the case of gridiron street systems and with good design in the case of super blocks.

(2) Densities are in terms of persons per gross acre. The indication (1934) shows that the density reported in 1934 is assumed to continue in those study areas found to accord with the factors leading to Conclusions 5 and 7. In those study areas where the 1934 density exceeded the "estimated average density" shown for Conclusions 1, 2 and 3, the 1934 density was used rather than the estimated figure.

good percentage of paved streets, sewer and water lines suggests that the areas are ripe for development.

Many of these medium rent single-family areas contain scattered two-family houses and small apartments. See footnote (2) in Table 14. No area has, however, been recommended for this classification unless there is evidence of recent single-family development to indicate that this, rather than two-family dwellings or apartment houses, will be its logical and desirable future. See Figure 59. This category embraces large sections of Queens, Staten Island, southeast Brooklyn and scattered districts in the eastern part of The Bronx. It is significant that Manhattan contains no single-family areas of sufficient size to justify a separate classification as such.

Two-Family Dwellings

There are few areas of substantial size in the city that are built up solidly with two-family

houses. Many areas, however, contain such a large proportion of two-family houses that further construction of single-family dwellings appears unlikely. These areas have been recommended as logical places for continued construction of two-family houses and might also be suitable for single-family row houses, under reasonable safeguards. It is expected that lots will average 37½ feet in width, except for row houses. Rents may be expected to range from \$30 to \$60 per month, except in a few unusual sections where higher rents now prevail and may continue. Most of the areas placed in this category have been developed within the last ten or twenty years. Two-family areas need bus service to a transit line, as a minimum, and many are near to a railway or rapid transit station. See Figure 60. This type of development is recommended for the Woodlawn and Pelham Bay sections of The Bronx; for Highland Park and Bay Ridge in Brooklyn; and for small areas in Queens, including parts of Astoria and Corona.

Unripe and Impractical Areas

Areas labeled "unripe and impractical" are inaccessible to railroads, rapid transit lines and bus routes. See Figure 57 for other determining factors. They had few if any paved streets and practically no sewers and water mains. Most of these sections had no population in 1934 and many of them are swampy or under water. All of them would require heavy expenditures to provide even the minimum public facilities necessary for residential development. Other districts, better situated and with adequate improvements, contain more than sufficient land for future needs. See Table 15. It would, therefore, be uneconomic to force the growth of areas that are not needed and which, if developed, would place unwarranted financial burdens on property owners and the city's taxpayers. The conclusion that an area is unripe applies to the near-term future. Eventually, many of these tracts of land may acquire residential advantages that they do not now possess. When considered in relation to the entire city, it is obvious that they should not now be recommended as suitable locations for residential buildings. See Figure 61. The principal parts of the city that were found unripe and impractical are in northeastern Queens; the land adjoining Jamaica Bay; the western half of Staten Island; and some outlying sections of the east Bronx.

Areas Prematurely Developed

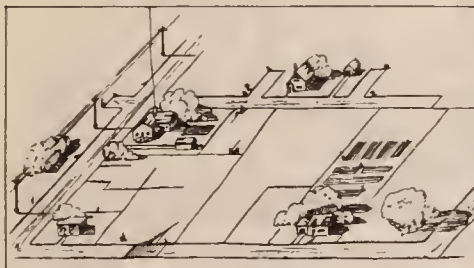
Some areas, lacking in transportation and local public improvements, are by any reasonable standards unripe for permanent residential use. They have nevertheless experienced sporadic home-building which can only be termed "premature". Such areas are characterized by a thin scattering of houses, usually of the low-priced single-family type, interspersed with vacant lots and surrounded by large undeveloped sections which are still held in acreage. Other areas more suitably located and served by public facilities contain ample land for additional homes. See Table 15 and Figure 62. Consequently, further construction in these premature subdivisions is not recommended; it would entail high costs that cannot be justified. Fortunately, these premature sections do not bulk large in area. Most of them lie in southern and eastern Queens, eastern Bronx and Staten Island.

Areas Not Suitable for Further Residential Construction

The older residential sections which have experienced a gradual infiltration of non-residential uses are frequently located adjacent to industrial and business districts. They are generally obsolete residential neighborhoods, mostly in Manhattan and downtown Brooklyn, that have been invaded by expanding commerce and manufacturing. See

TABLE 15 Ultimate Demand and Supply of Housing (In terms of Population)			
Borough	Demand (1)	Supply (2)	Ratio
Manhattan	1,678,000	1,803,935	1.07
The Bronx	1,987,000	2,207,049	1.11
Brooklyn	3,327,000	3,617,949	1.08
Queens	1,900,000	2,086,115	1.09
Richmond	335,000	362,802	1.08
Totals	9,227,000	10,077,850	1.09
Note: (1) "Demand" is equivalent to the probable ultimate population indicated by the Population Study of the Mayor's Committee staff.			
(2) "Supply" is calculated from the average densities assigned to the various types of residential development suggested in the Residential Conclusions for each of the 725 study areas. See Table 14 and the text for further explanations.			

PRELIMINARY CONCLUSIONS AS TO RESIDENTIAL AREAS



AREAS PREMATURELY DEVELOPED

PRIMARY



SECONOARY



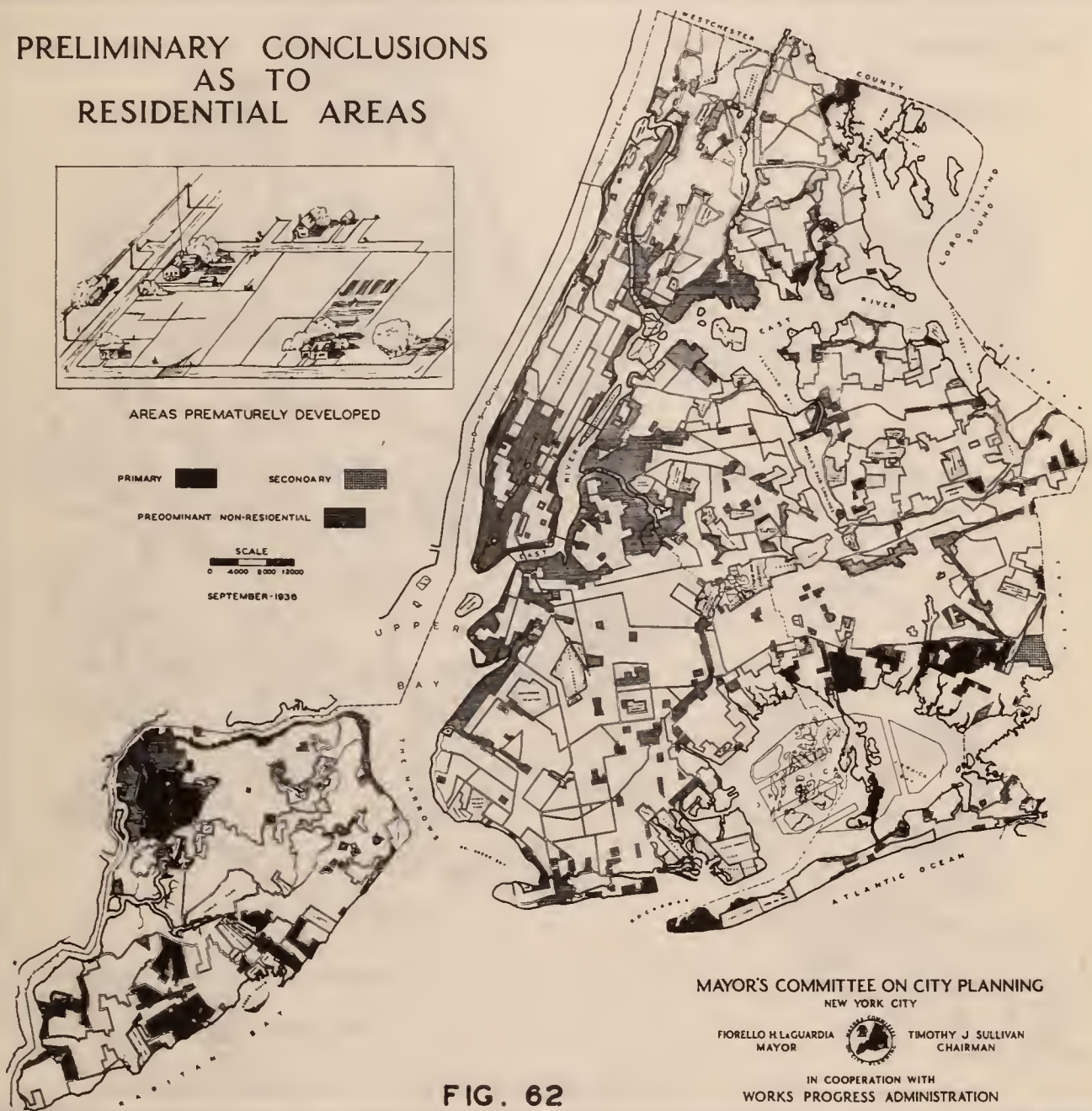
PREOONINANT NON-RESIDENTIAL



SCALE

0 4000 8000 12000

SEPTEMBER-1936



MAYOR'S COMMITTEE ON CITY PLANNING
NEW YORK CITY

FIORIELLO H. LA GUARDIA
MAYOR

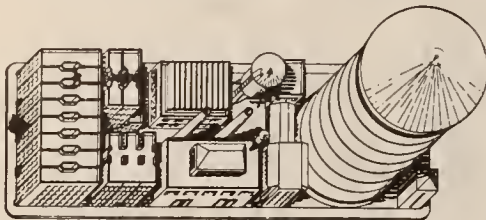


TIMOTHY J. SULLIVAN
CHAIRMAN

IN COOPERATION WITH
WORKS PROGRESS ADMINISTRATION

FIG. 62

PRELIMINARY CONCLUSIONS AS TO RESIDENTIAL AREAS



AREAS NOT SUITABLE FOR FURTHER RESIDENTIAL
CONSTRUCTION BECAUSE OF DECLINING RESIDENTIAL
CHARACTER AND INFLUX OF NON-RESIDENTIAL USES

PRIMARY SECONDARY

PREDOMINANT NON-RESIDENTIAL

SCALE
0 4000 8000 12000

SEPTEMBER-1936

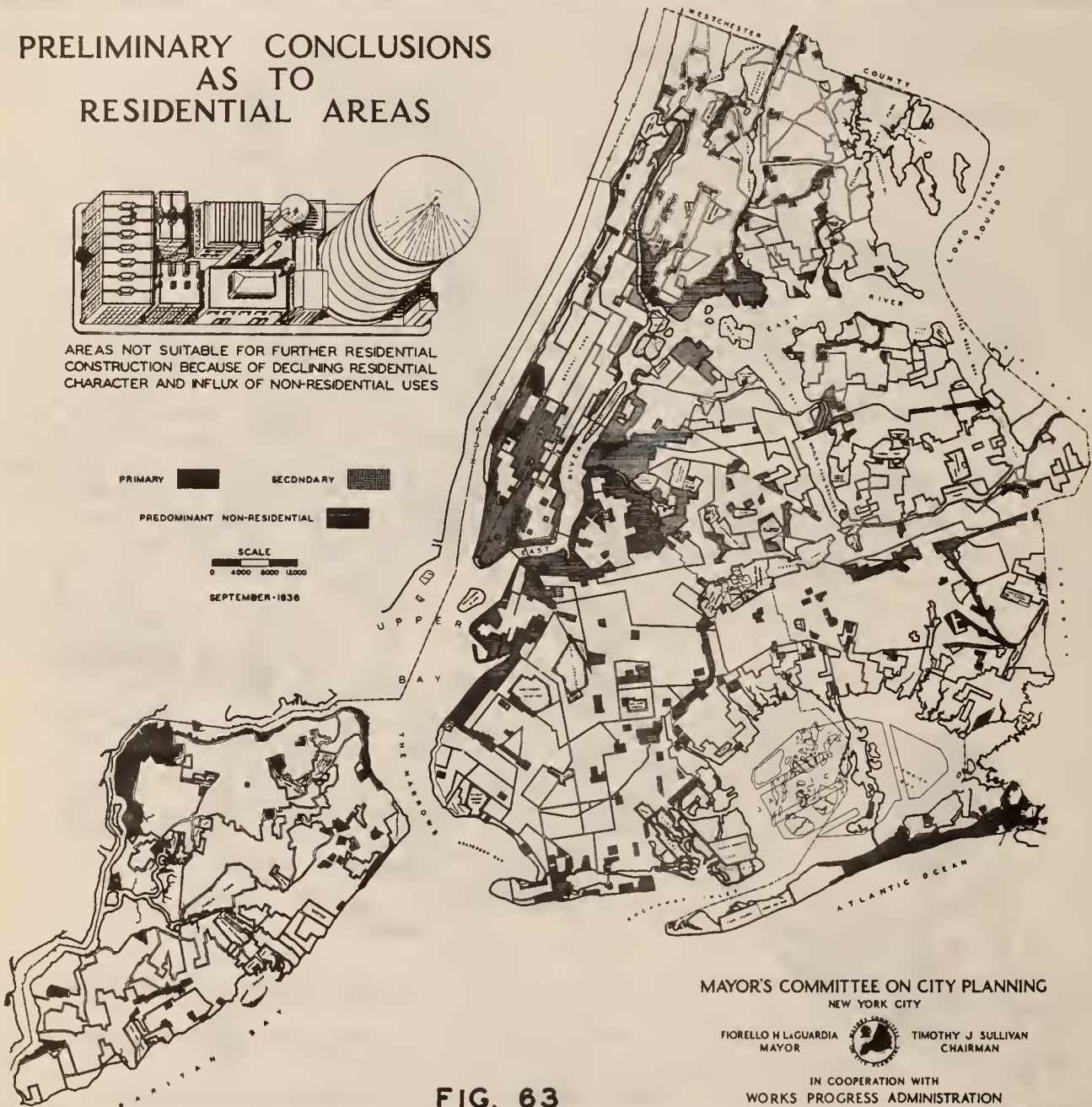


FIG. 63

MAYOR'S COMMITTEE ON CITY PLANNING
NEW YORK CITY

FIORIELLO H. LA GUARDIA
MAYOR



TIMOTHY J. SULLIVAN
CHAIRMAN

IN COOPERATION WITH
WORKS PROGRESS ADMINISTRATION

U.S. GOVERNMENT PRINTING OFFICE: 1936-07-5037
12-55111-1

PRELIMINARY CONCLUSIONS AS TO RESIDENTIAL AREAS



REHABILITATION OF EXISTING RESIDENTIAL BUILDINGS

PRIMARY SECONDARY PREDOMINANT NON-RESIDENTIAL

SCALE
0 4000 8000 12000
SEPTEMBER-1936

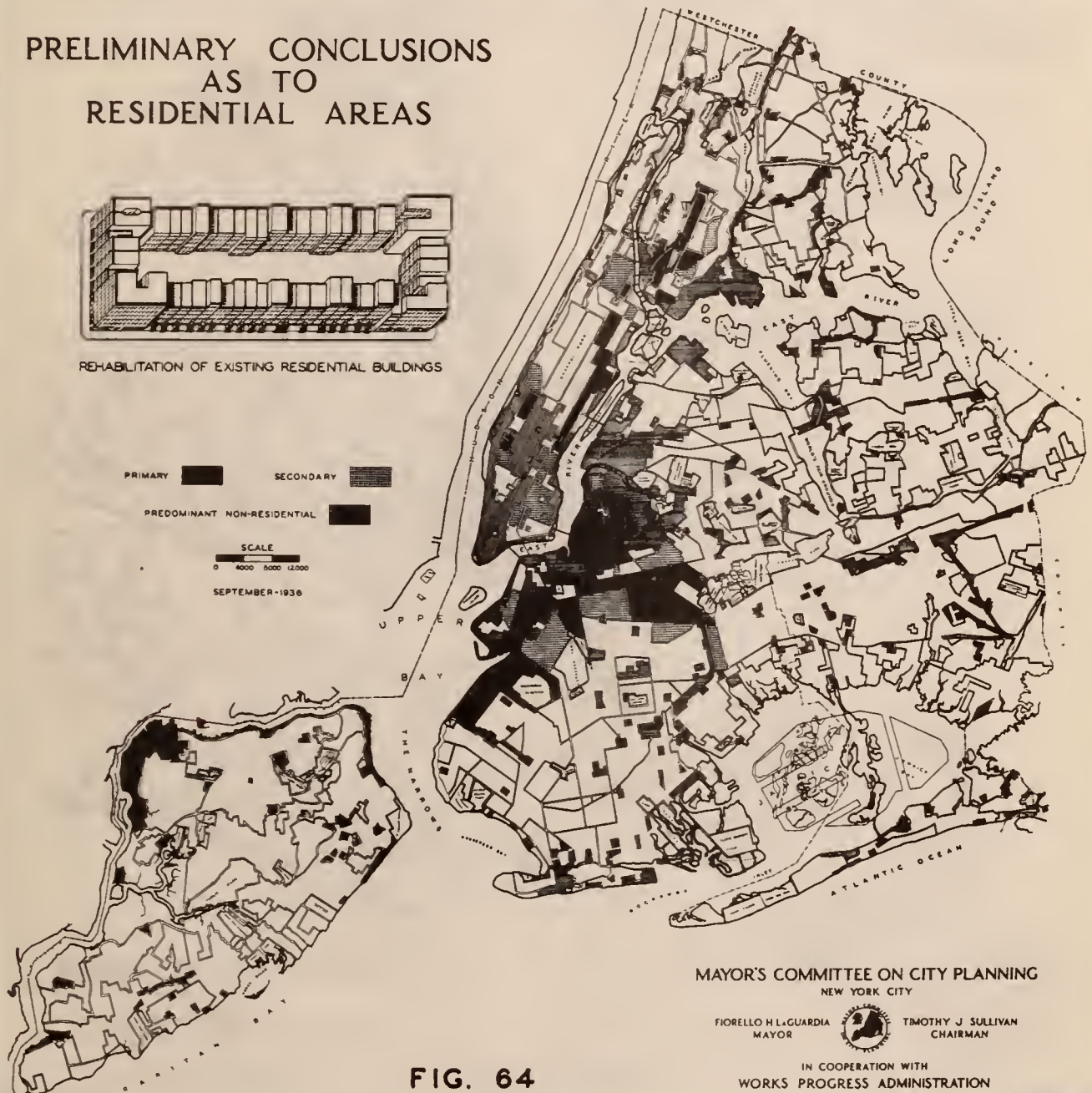


FIG. 64

MAYOR'S COMMITTEE ON CITY PLANNING
NEW YORK CITY

FIORELLO H. L. GUARDIA
MAYOR

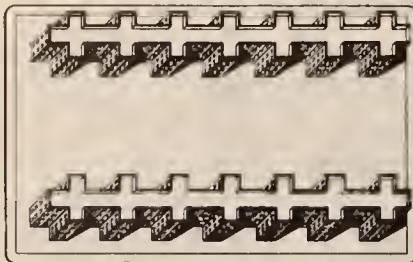


TIMOTHY J. SULLIVAN
CHAIRMAN

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U.S. GOVERNMENT PRINTING OFFICE: 1936
16-30775-5

PRELIMINARY CONCLUSIONS AS TO RESIDENTIAL AREAS



DEMOLITION OF EXISTING RESIDENTIAL
BUILDINGS, COMBINED WITH EXTENSIVE
NEW CONSTRUCTION OF LOW RENT HOUSING

PRIMARY SECONDARY
 PREDOMINANT NON-RESIDENTIAL

SCALE
0 4000 8000 12000
SEPTEMBER-1936

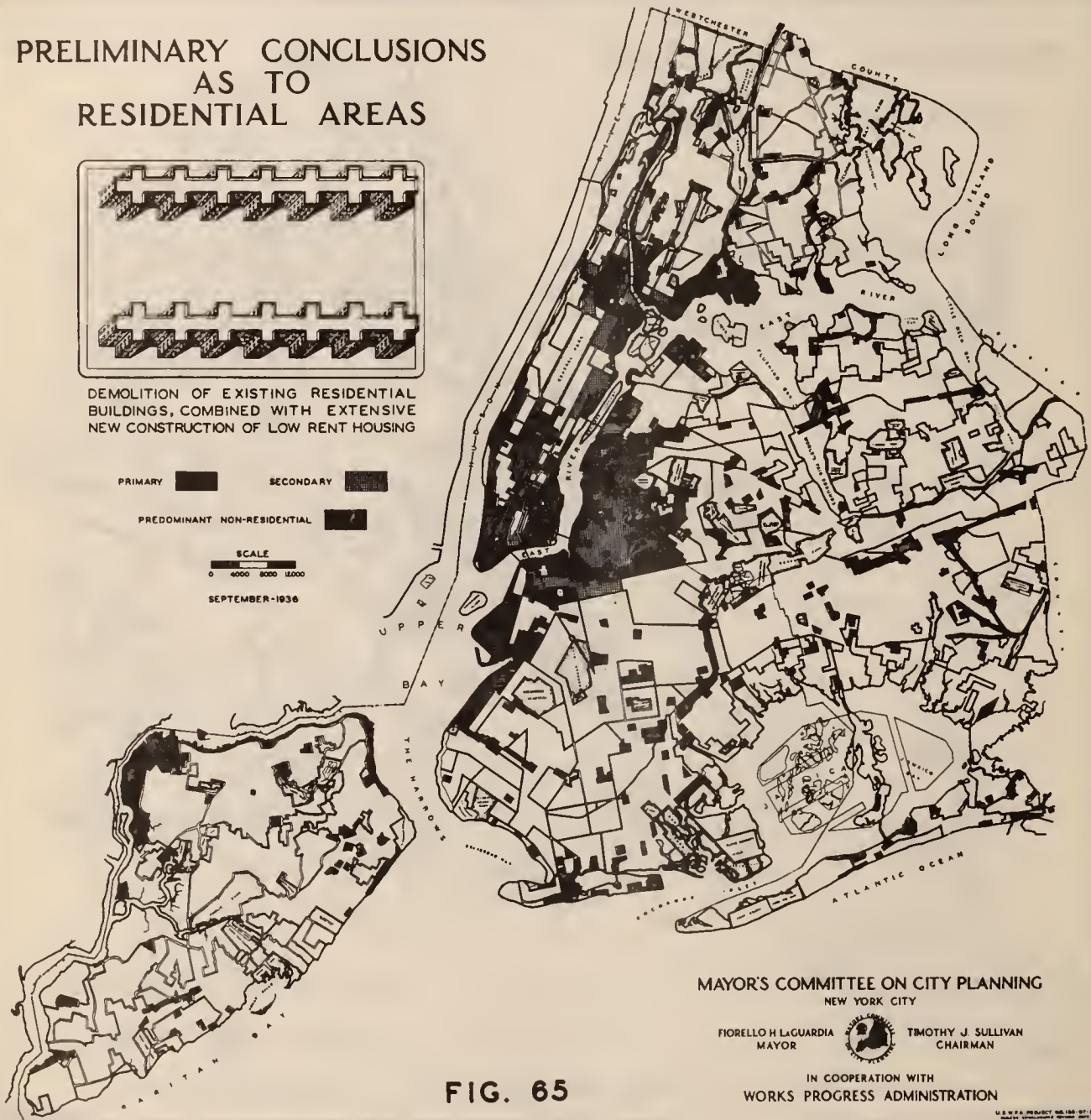


FIG. 65

MAYOR'S COMMITTEE ON CITY PLANNING
NEW YORK CITY

FIORIELLO H. LAGUARDIA
MAYOR



TIMOTHY J. SULLIVAN
CHAIRMAN

IN COOPERATION WITH
WORKS PROGRESS ADMINISTRATION

U.S. W.P.A. PROJECT NO. 146-07-1027
NEW YORK, N.Y. 1936
750 1936 C

Figure 63. They exhibit excessive vacancies in dwellings and are characterized by poor condition of buildings, disproportionately high land values, and relatively high ratios of workers to residents. See Figure 57.

Actually, only a few of the residential areas adjoining commercial districts fall into this category. Most of the non-residential areas contain ample room for expansion of business and industry within their boundaries, and have not encroached into surrounding residential neighborhoods.⁽³⁴⁾ Areas found to be "declining residential" give evidence of a sounder future if turned over entirely to non-residential uses. It would not seem reasonable to attempt to maintain the residential character of such areas, which at best is unstable and unsatisfactory for dwellings.

Rehabilitation of Existing Residential Buildings

There are many sections of the city where existing buildings are neither entirely obsolete nor very good, and where the opportunities for erection of new structures are not especially attractive. The existing dwellings still have useful life and do not need to be replaced. Such areas have been designated for "rehabilitation", with a view to a decrease in vacancies and some improvement in rents. Rents in these areas were for the most part from \$20 to \$29 per month, and vacancies averaged 15 to 25 percent in 1934. Buildings were over twenty years old and in fair to bad condition. Some of these areas will probably have to be replanned and rebuilt within a couple of generations, or after rehabilitation costs have been amortized, in order to maintain their competitive position.

The "rehabilitation" areas are well situated with reference to rapid transit lines and do not have an excessive proportion of workers to residents. See Figure 64. Population density in these sections ranged from 100 to 300 persons per gross acre. Rehabilitation is indicated as appropriate in much of the eastern part of mid-Manhattan, the older parts of southern Bronx, and the Williamsburg, Bushwick and Park Slope neighborhoods of Brooklyn.

Demolition of Existing Residential Buildings, Combined with Extensive New Construction of Low Rent Housing

Whole neighborhoods contain tenements which in 1934 were over 35 years old, in bad condition,

and with more than 20 percent vacancies in dwellings. Prevailing rents were \$29 and less. These and other factors, shown in Table 57, indicate that such areas have outlived their useful life, have become obsolete for modern city living and, therefore, present opportunities for demolition and rebuilding. If these sections are readily accessible to rapid transit or within walking distance of centers of employment, and do not have an excessive proportion of their area devoted to non-residential uses, they are obviously locations for new low rent housing.

This conclusion does not imply that all parts of such areas should be rebuilt with new housing. When the characteristics of the area indicate general obsolescence, but do not point clearly to some other future, a substantial part of the area should eventually be cleared and rebuilt. Low cost housing areas are limited to sections with a population density of more than 200 persons per acre, and with land value not exceeding \$760 per front foot. The best opportunities for immediate clearance exist where values are below this figure. See Figure 65.

There is a possibility of substantial amounts of new medium rent construction on the higher priced land falling in this category. Knickerbocker Village is a notable example. Areas found suitable for demolition and new low rent housing are located in Red Hook, Greenpoint, English Kills and part of Williamsburg in Brooklyn; the Lower East Side, Harlem and East Harlem in Manhattan; and a section of Long Island City in Queens.⁽³⁵⁾

High Rent Apartment Houses

This classification covers those areas that are especially attractive for new fireproof apartments of the type that would lease at above \$60 per month. Many sections with old brownstone residences and old-law tenements, which are gradually giving way to modern apartment houses of the higher rent class, are in this category. If new buildings in these areas are to attract tenants, dwellings should not cover over 50 percent of the lot. In addition to materially improved housing standards, the high rent city-type apartment districts must have good rapid transit and fully improved streets.

The factors indicating this type of area call for land values ranging from \$760 per front foot and up. Districts suitable to meet the inevitably

(34) See the "Non-Residential Area Survey" section of the chapter on *Special Studies* in this volume.

(35) It is perhaps noteworthy that practically all of the large-scale public housing projects subsequently erected in New York are located within these "demolition" areas.

limited demand for the more expensive, larger apartments are confined principally to mid-Manhattan on both sides of Central Park; including adjacent areas extending to the Hudson River on the west and to Third Avenue on the east; Sutton Place; and Brooklyn Heights. See Figure 66.

Medium Rent Apartment Houses

There are many new residential areas with a population density over 100 persons per acre, where land values are not in excess of \$1450 per front foot, and where the location and other factors do not justify average rents in excess of \$60. In the majority of such areas the present type of new-law apartment house development largely fixes the pattern for the future. Accordingly, further construction of apartment houses, both on vacant land and on sites previously occupied by older houses, seems to offer the best opportunities for efficient use of the land. If these developments are not to be obsolete in the near future, new buildings will cover a smaller proportion of their sites than existing dwellings in order to obtain competitive advantage by providing more light, air and other amenities. See Figure 67. The medium rent apartment is expected to prevail throughout upper Manhattan and most of the great central section of The Bronx, between Broadway and Bronx River; also in a wide belt through central and southern Brooklyn, from the Cemetery of the Evergreens to Gravesend Bay.

High Rent Garden Apartments

There are many outlying areas where land is valued below \$760 per front foot, which are developing or may be developed with an open type of apartment house. This kind of construction, occupying a small proportion of the site and providing large courts for relaxation and recreation, combines the facilities of the city with the attractions of the country. Areas suitable for such development are mainly limited to sections of recent development, where the condition of the present buildings is good and rents average above \$60 per month. See Figure 68. They were found to occur in small sections of The Bronx, Queens and south Brooklyn. Accessibility to rapid transit or location within one-half mile of a railroad station is an essential factor.

Medium Rent Garden Apartments

This classification has characteristics similar to the high rent garden apartment areas described

above. The sections recommended for the medium rent garden type apartment development had, however, lower prevailing rents, the necessary open land and other conditions which indicate that low density apartments are the most suitable development. See Figure 57 for a tabulation of determining factors.

These areas are of course almost entirely devoid of the more densely built city type of apartment with their relatively high concentrations of population. See Figure 69. The medium rent garden apartment development seems particularly appropriate in parts of Astoria, Sunnyside, Woodside and Elmhurst in Queens; and in the Seagate and Coney Island districts of Brooklyn.

ULTIMATE DEMAND AND SUPPLY OF HOUSING

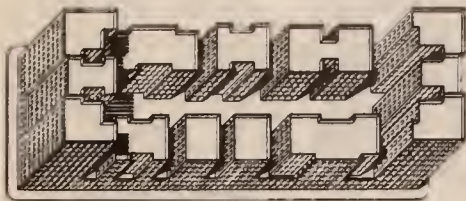
The 725 residential study areas comprise some 151,300 acres, including streets, vacant land and other accessory uses normally found in residential districts. There are about 9,500 acres of these predominant residential areas in Manhattan, nearly 20,000 acres in The Bronx, some 35,000 acres in Brooklyn, approximately 56,000 acres in Queens and 31,300 acres in Richmond. Figures 58 through 69 show the geographical distribution of the twelve types of residential development, which are discussed above, by primary and secondary incidence. Table 13 shows the proportion of the predominant residential acres which the Residential Conclusions indicate for each type of development, by borough and for the city.

A tabulation of ratios, or acreage figures, and the several maps cannot, however, reveal the adequacy of the proposed future pattern. They fail to show the relationships between the ultimate population and the number of people that would be accommodated by the Residential Conclusions, according to the type of housing and the distribution of families by economic levels. This section of the report compares the supply of housing that would be provided by the Residential Conclusions with the probable future demand for dwellings.

Relation to Ultimate Population

An appropriate population density was determined and assigned to each of the twelve types of residential development included in the Residential Conclusions. These densities are based upon population concentrations observed in established neighborhoods and upon considerations of good

PRELIMINARY CONCLUSIONS AS TO RESIDENTIAL AREAS



HIGH RENT APARTMENT HOUSES

PRIMARY  SECONDARY 
 PREDOMINANT NON-RESIDENTIAL 

SCALE
 0 4000 8000 16000

SEPTEMBER 1936

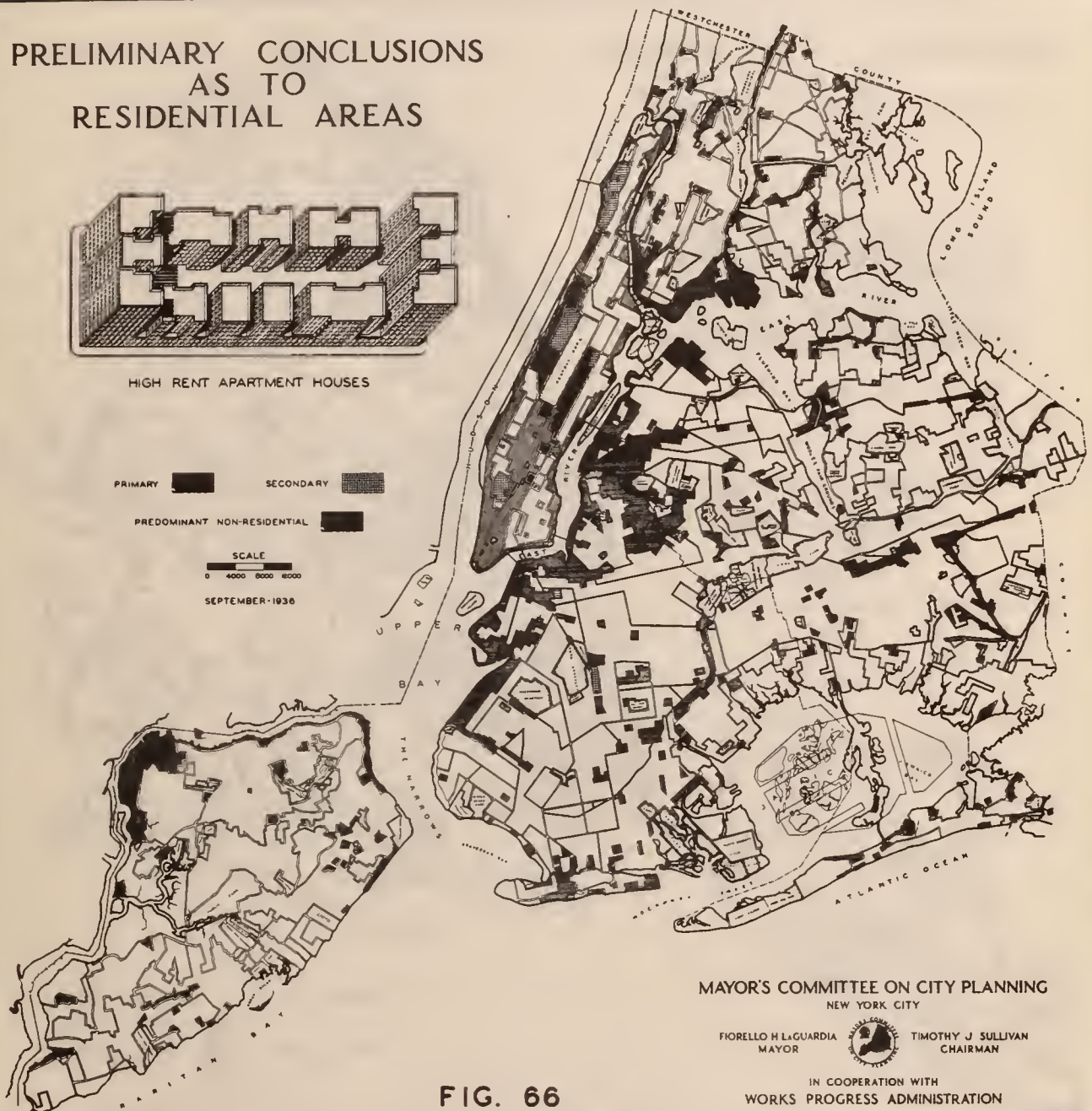


FIG. 66

MAYOR'S COMMITTEE ON CITY PLANNING
 NEW YORK CITY

FIORIELLO H. LAGUARDIA
 MAYOR

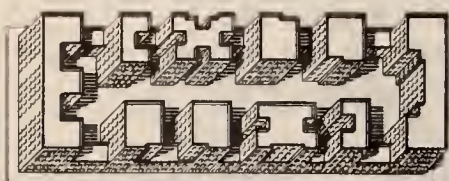


TIMOTHY J. SULLIVAN
 CHAIRMAN

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U.S. GOVERNMENT PRINTING OFFICE: 1936
 16-40521

PRELIMINARY CONCLUSIONS AS TO RESIDENTIAL AREAS



MEDIUM RENT APARTMENT HOUSES

PRIMARY  SECONDARY 
PREDOMINANT NON-RESIDENTIAL 

SCALE
0 4000 8000 12000

SEPTEMBER-1936

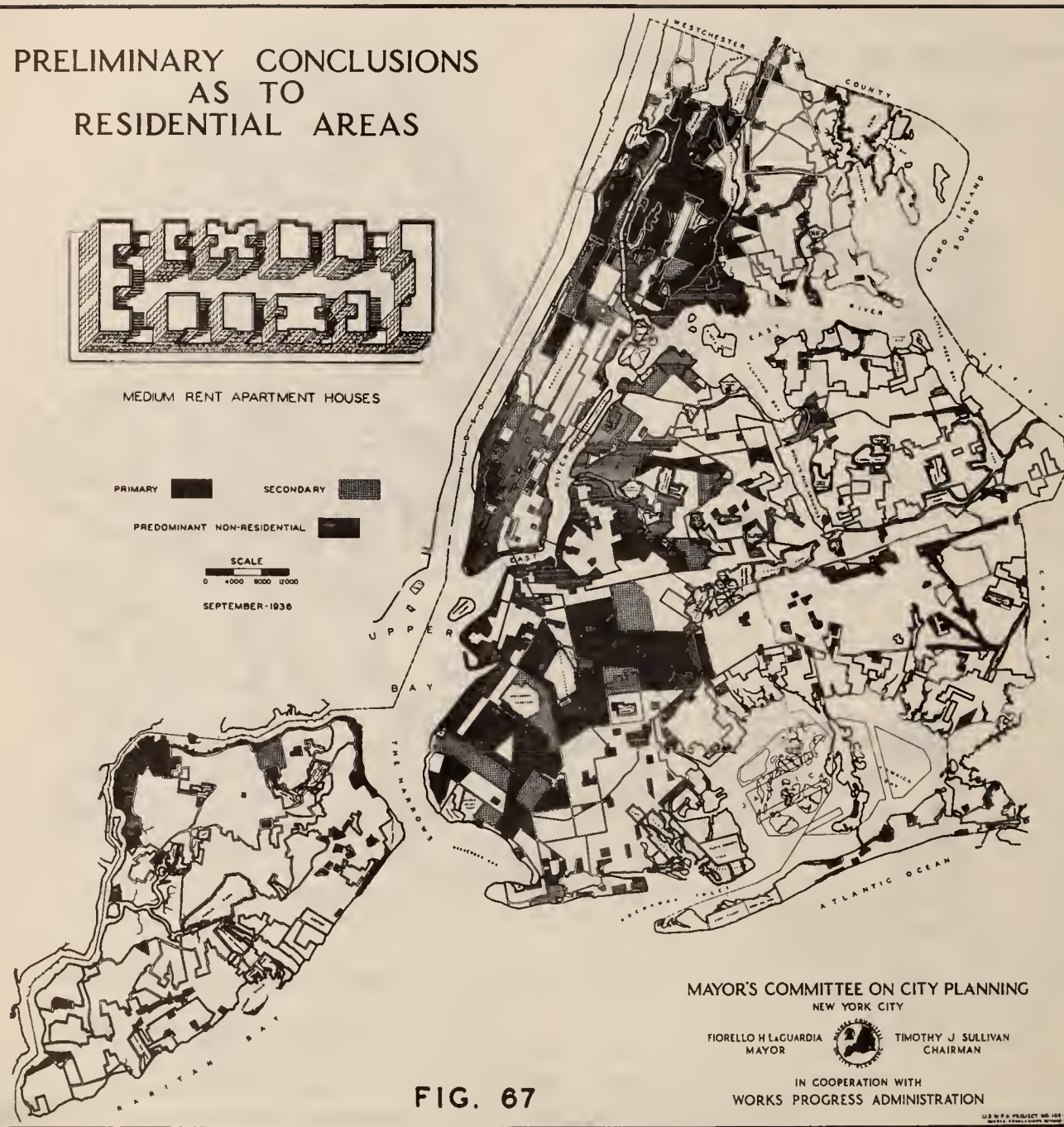


FIG. 67

MAYOR'S COMMITTEE ON CITY PLANNING
NEW YORK CITY

FIORIELLO H. LA GUARDIA
MAYOR

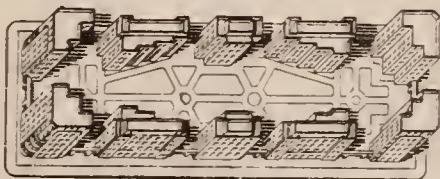


TIMOTHY J. SULLIVAN
CHAIRMAN

IN COOPERATION WITH
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PRELIMINARY CONCLUSIONS AS TO RESIDENTIAL AREAS



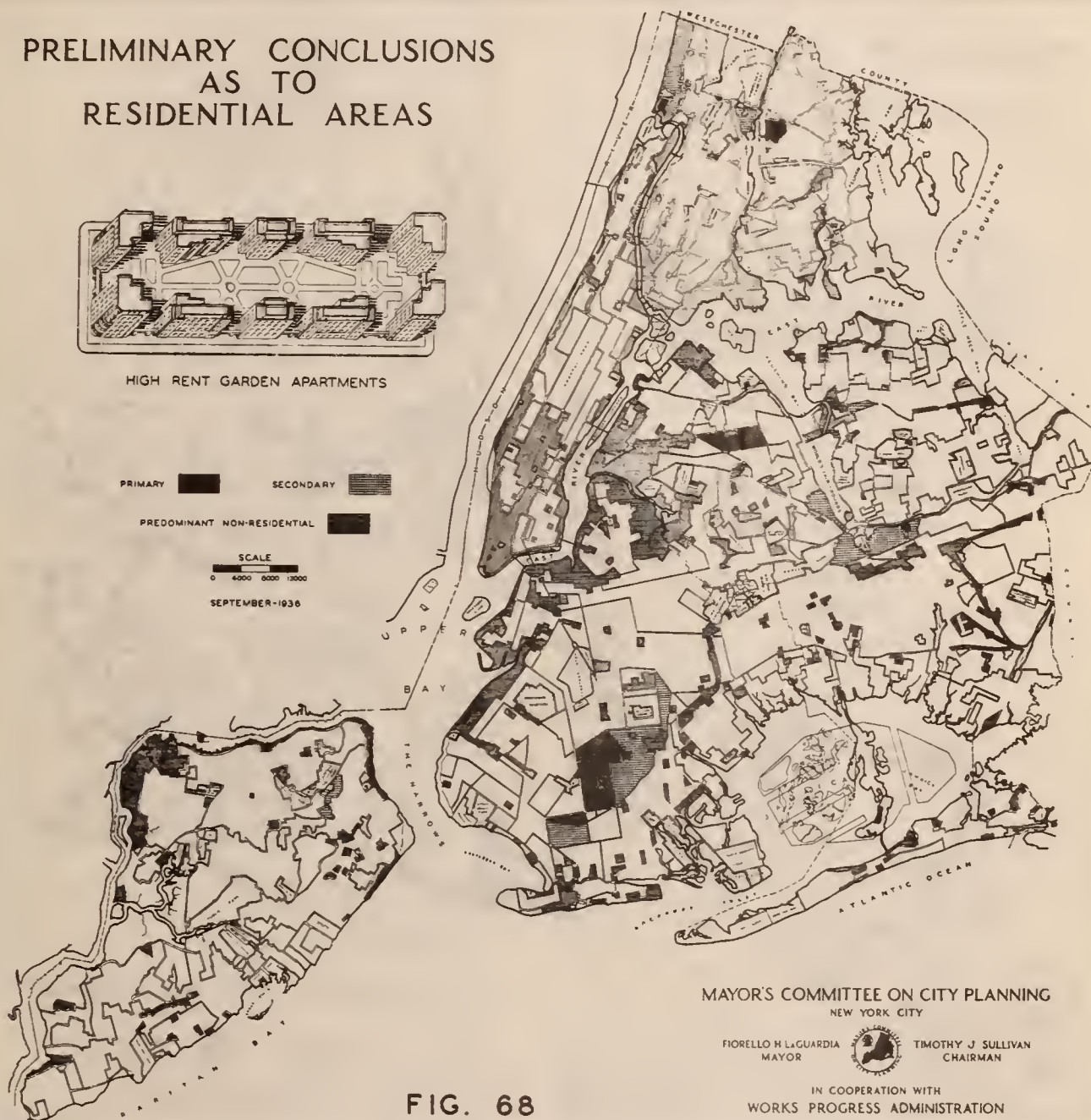
HIGH RENT GARDEN APARTMENTS

PRIMARY SECONDARY

PREDOMINANT NON-RESIDENTIAL

SCALE
0 4000 8000 12000

SEPTEMBER-1936



MAYOR'S COMMITTEE ON CITY PLANNING
NEW YORK CITY

FIORIELLO H. LA GUARDIA
MAYOR

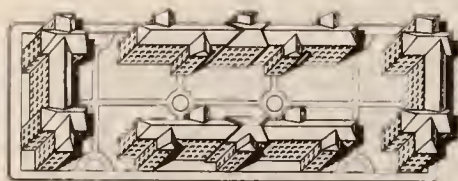


TIMOTHY J. SULLIVAN
CHAIRMAN

IN COOPERATION WITH
WORKS PROGRESS ADMINISTRATION

FIG. 68

PRELIMINARY CONCLUSIONS AS TO RESIDENTIAL AREAS



MEDIUM RENT GARDEN APARTMENTS

PRIMARY SECONDARY
 PREDOMINANT NON-RESIDENTIAL

SCALE
0 4000 8000 12000
SEPTEMBER 1936

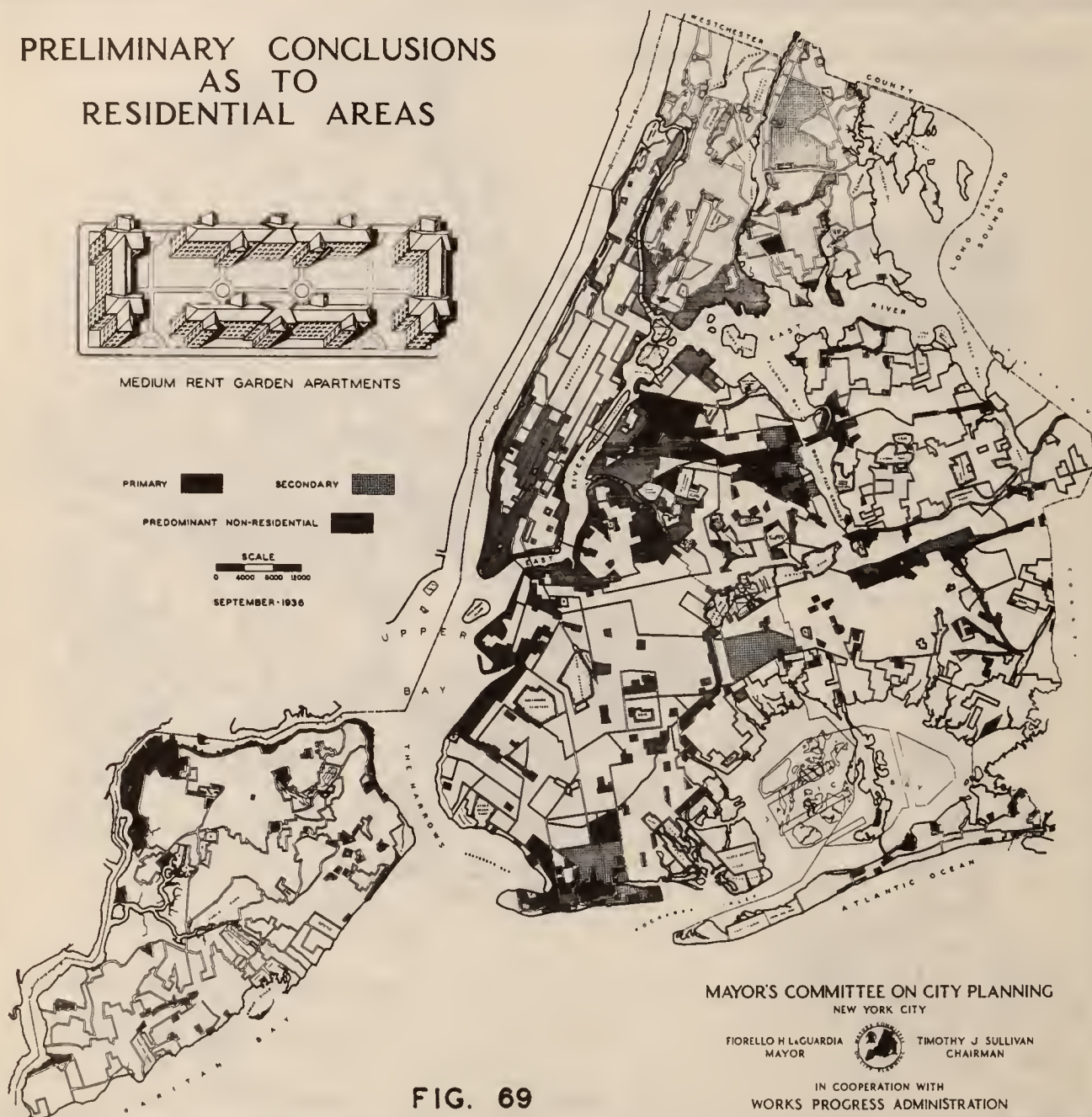


FIG. 69

MAYOR'S COMMITTEE ON CITY PLANNING
NEW YORK CITY

FIORIELLO H. LAGUARDIA
MAYOR



TIMOTHY J. SULLIVAN
CHAIRMAN

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U.S.W.P.A. PROJECT NO. 12 BY 4097
1936-1937
F. C. BARNES

design where no comparable neighborhood exists in the city, such as large-scale neighborhood unit housing projects and new types of low coverage garden apartments. These population densities, which are shown in Table 14, allow for normal occupancy of dwelling units by families averaging three and one-half persons. They also embody improved housing conditions, such as relatively low land coverage and lower average building heights, which would provide more light, air and amenities for living.

The assigned densities are considerably below the population that could be housed in most sections of the city if dwellings were built to the full limits permissible under the Building Zone Resolution and the Multiple Dwellings Law. The Zoning Study of the Mayor's Committee staff shows that the average density in an area of ten or twenty city blocks is never as high as the density resulting from an apartment, which takes full advantage of the maximum building envelope allowable under present laws, on an individual lot or block front. For example, the density assumed in areas suitable for high rent city type apartments is 290 persons per gross acre. This density was exceeded in only five residential study areas in 1934. Present laws would, however, permit a density in excess of 1,200 persons per gross acre in many sections of the city.

Using the assigned densities, the total population that could be housed in the future residential pattern was computed. In this calculation it was assumed that the type of building in most study areas would be homogeneous, taking into consideration the primary and secondary conclusions where applicable. Where no clear-cut homogeneity was indicated by the analysis, secondary conclusions were assumed to apply to 30 percent of the gross acreage of the study areas in which they occur.

The result of this computation is summarized in Table 15. It shows that more than 10,000,000 persons could be comfortably housed in the 725 study areas if developed according to the Residential Conclusions pattern. It is important to remember that this calculation makes allowance for normal vacancies in dwellings, and is based upon an average density of buildings that would represent a more open type of city development than is now found in most sections of New York. Consequently, the figure for housing "supply", which exceeds "demand" by nearly 10 percent, indicates that the future pattern would be more than adequate to house the ultimate population of 9,227,000 persons. This ultimate population

figure is believed to be a liberal estimate for the probable maximum growth of the city.⁽³⁶⁾ As shown by Table 15, the "supply" of housing provided by the Residential Conclusions would also exceed the "demand" for dwelling space by a good margin in each borough.

This comparison also reveals that there is no need for over-crowding the land with buildings and people. The expected ultimate population is not infinity, but a tangible quantity which represents an increase of only 34 percent over the 1934 population of New York City. The Real Property Inventory reports that more than 200,000 persons were living in sections of the city which the Mayor's Committee staff designated as Predominant Non-Residential Areas.⁽³⁷⁾ In computing the "supply" of housing provided by the Residential Conclusions, it was assumed that these Non-Residential Areas, as well as the residential study areas found to be "declining" due to the influx of business or industry, would not house any population in the future. In other words, the probable ultimate population of the city could easily be housed in the *residential* areas alone, thus leaving the predominant non-residential sections entirely free for commercial and industrial uses.

Types of Housing

The 1934 Real Property Inventory recorded the type of housing as single-family, two-family, multi-family and miscellaneous. The apartment hotel, lodging house, club and institution are included in the miscellaneous category. Table 16, summarizing the 1934 reports, reveals that some 12 percent of all dwellings in the city were single-family residences, about 13 percent were two-family houses and over 74 percent of the family quarters were in multi-family and miscellaneous buildings. This table also shows the proportion of family quarters that would be provided in each type of housing according to the Residential Conclusions.

Referring to Table 16, it will be noted that for

(36) See the chapter entitled "Population Pattern" in this volume for population estimates and a discussion of the probable future growth. See also footnotes 22 and 23 in the chapter entitled "Population Pattern" for a description of the adjustments made to balance the "supply" of housing with the "demand" population in the study areas. These adjustments were made in order to determine the distribution of the ultimate population of 9,227,000 persons in accordance with the residential pattern in studies of present deficiencies and future needs for public services of a local character.

(37) See the chapter entitled "Non-Residential Area Survey" in the *Special Studies* section of this volume for further information on these predominant non-residential sections of the city.

TABLE 16
Proportion of Family Quarters By Type of Dwelling for the Year 1934
and according to the Residential Conclusions

Housing Type	Manhattan		The Bronx		Brooklyn		Queens		Richmond		City Total	
	1934	Supply	1934	Supply	1934	Supply	1934	Supply	1934	Supply	1934	Supply
%Single-Family	0.9	0	5.4	6.5	11.3	5.3	36.1	39.4	55.8	87.7	12.4	14.5
%Two-Family	0.2	0	8.7	8.5	20.3	6.7	24.4	10.5	25.4	5.1	13.2	6.3
%Multi-Family*	98.9	100.0	85.9	85.0	68.4	88.0	39.5	50.1	18.8	7.2	74.4	79.2
All Types	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

*Includes apartment hotels, lodging houses, clubs and institutions, which in 1934 contained under 8% of the total family quarters in the city.

the entire city the "supply" of family quarters in single-family dwellings and apartments would exceed the 1934 ratios, but there would be a percentage decrease in the number of two-family houses. The suggested future residential pattern would provide a larger proportion of single-family dwellings in The Bronx, Queens and Richmond, but a smaller percentage in Manhattan and Brooklyn than was reported by the Real Property Inventory. The relative number of two-family dwellings would be less than the 1934 percentages in all boroughs. The proportions of dwellings in apartments would increase over 1934 in the city and in three boroughs, but would be lower in The Bronx and Richmond.

The demand for single and two-family dwellings

in Manhattan was so slight that it was ignored in calculations of "supply". There seems to be evidence that the two-family house is declining in popularity and that the well planned apartment is gaining. Hence, the "supply" of dwelling space which would be provided by the Residential Conclusion compares favorably with the 1934 ratios and seems generally adequate to the probable demand for family quarters by type of housing.

Economic Demand and Supply

In 1930 the Bureau of Labor Statistics rent index for New York City was at 100, but in 1934 the index was only 77. Certain sections of the financial studies, reported in Part III of this series

TABLE 17
Percentage Distribution of Demand and Supply of Dwellings By Rental Groups

Rental Group	Manhattan		The Bronx		Brooklyn		Queens		Richmond		City Total	
	Demand	Supply	Demand	Supply	Demand	Supply	Demand	Supply	Demand	Supply	Demand	Supply
% Lower Rent (1)	33.0	31.1	5.5	5.0	18.2	16.9	6.2	5.7	15.8	14.6	15.6	14.4
% Medium Rent (2)	43.4	46.1	76.3	78.0	55.1	57.6	59.0	61.3	55.6	58.1	58.4	60.8
% High Rent (3)	23.6	22.8	18.2	17.0	26.7	25.5	34.8	33.0	28.6	27.3	26.0	24.8
% Totals	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: "Demand" is predicated on percentages for the year 1930 when rents were "normal" according to the index of the Bureau of Labor Statistics. "Supply" is computed from the population that could be housed at "normal" rentals, according to the rent levels assumed for the Residential Conclusions pattern.

(1) Lower Rent is less than \$30 per family per month.

(2) Medium Rent ranges from \$30 to \$75 per family per month.

(3) High Rent is \$75 and more per family per month.

of reports, were predicated on the supposition that the index of 100 was "normal" and that rents would return to the level of 1930 in the future. The same assumption was made in determining the economic demand and supply of housing, namely that "normal" rentals would ultimately prevail in the city.

The 1930 Census reported the number of families according to the value of owner-occupied homes and the rentals paid by tenants. The staff assumed that the 1930 proportions of families in each rental group represented the "normal" economic base upon which future demand could be expected to depend. The probable ultimate population was divided into three major rental groups according to the percentage distribution of these groups in 1930; the value of owner-occupied homes being expressed in equivalent rentals by capitalizing value. Under the heading of "demand", Table 17 shows the percentage of persons in each major rental group according to the analysis of 1930 Census reports. Table 18 shows the distribution of the ultimate population by rental groups according to the "demand" percentages given in Table 17.

The economic supply was determined in the following manner. Rentals, appropriate to the several types of development, were assigned to each study area according to the Residential Conclusions. See Figure 57. The population of 10,077,850 that could be housed in the future residential pattern was then apportioned, according to the assigned rent, into the corresponding major rental groups, namely lower, medium and high rent. The results of this apportionment are summarized in Table 18 in the columns headed "Supply". Reference to this tabulation will reveal that the estimated population which could be housed in the dwelling space provided by the Residential Conclusions exceeds the probable demand in each major rental group in all of the boroughs. The proportion of population in each major rental group, supplied under the Conclusions, is shown in Table 17 in the column headed "Supply".

Examination of Tables 17 and 18 will show that on the basis of the assumptions employed in these calculations, the Residential Conclusions would supply more than enough housing to meet the probable economic demand of the ultimate population, measured in terms of rental levels.

These comparisons of "demand" and "supply" indicate that the Residential Conclusions present a sound general design for the building of the future city. Alterations and improvements in the

TABLE 18
Demand and Supply Population By Rental Groups
(Figures are in Thousands of Persons)

Rental Group	Manhattan		The Bronx		Brooklyn		Queens		Richmond		City Total	
	Demand	Supply	Demand	Supply	Demand	Supply	Demand	Supply	Demand	Supply	Demand	Supply
Lower Rent (1)	553.7	561.0	109.3	110.4	605.5	611.4	117.8	118.9	52.9	53.0	1,439.4	1,451.2
Medium Rent (2)	728.3	831.6	1,516.1	1,721.4	1,833.2	2,084.0	1,121.0	1,278.8	186.3	210.8	5,388.6	6,127.3
High Rent (3)	396.0	411.3	361.6	375.2	888.3	922.6	661.2	688.4	95.8	99.0	2,399.0	2,499.3
Totals	1,678.0	1,803.9	1,987.0	2,207.0	3,327.0	3,617.0	1,900.0	2,086.1	335.0	362.8	9,227.0	10,077.8

Note: (1) Lower Rent is less than \$30 per family per month.

(2) Medium Rent ranges from \$30 to \$75 per family per month.

(3) High Rent is \$75 and more per family per month.

findings affecting particular neighborhoods could doubtless be made to advantage, after additional study. The basic pattern and the relationships between demand and supply of housing types and rental groups are, however, so close to the probable future needs of the city that only minor modifications of the general design may be anticipated as a result of more detailed study and refinement.

APPLICATIONS OF THE RESIDENTIAL CONCLUSIONS

One of the primary uses of the Residential Conclusions was their indication of the desirable distribution of future population. The chapter entitled "Population Pattern" in this volume indicates the method employed to adjust for each study area the "supply" population to the "demand" or ultimate population, which totals 9,227,000 for the city. The adjusted population distribution served as the basis for determining the city's future needs for rapid transit service and other public improvements of a local character. The several studies of public improvements are reported in Part II of the City-Wide Studies, *The Planning of Public Services for the City of New York*. Further applications of the Residential Study are described below.

The Residential Study and Community Planning

The local neighborhood cannot be intelligently planned as a separate entity. It is essential to consider the community in its relationship to other neighborhoods in the vicinity and to the city as a whole. Community planning in New York has been made easier as a result of the Residential Study. Every community, wherever located in the city, contains one or more of the residential study areas, for which the optimum future type of development has been determined. The Residential Conclusions give, therefore, a definite starting point for more detailed local studies and planning.

As part of a program undertaken with the co-operation of local sponsoring groups, the staff

made detailed field surveys and studies of several communities which, incidentally, permitted a further test of the validity of the Residential Conclusions. In every case the data obtained in these community studies confirmed the broad findings previously arrived at for the study areas involved. In the community studies, it was also possible to define the boundaries of those portions of a neighborhood to which the "primary" and "secondary" incidence of the more general Residential Conclusions might apply. The Community Planning Studies will probably be published at a later date in a separate report.

The Residential Study and Zoning

The lack of agreement between the present zoning and the actual or prospective use of property has already been mentioned. The Residential Study furnishes an important means of developing more rational zoning. It is superior to a land utilization map in that it envisages the future, instead of mirroring the present. A separate chapter in this volume is devoted to Zoning. Consequently it is not necessary to dwell on the fact that the staff's zoning studies were carefully correlated with the findings of the Residential Study.

For several communities, in which detailed planning studies have been made, the staff prepared revised zoning maps indicating how the land should be districted, in the light of Residential Study, for Use, Height and Area. These maps suggest the improvements that can be made within the limitations of the Building Zone Resolution as it existed prior to 1938.

The staff then went one step further and prepared for some of the Community Studies tentative zoning maps based on a proposed new zoning ordinance, which is outlined in the Zoning chapter of this volume. The provisions of this suggested zoning ordinance were designed to give effect to the findings of the Residential Study. Through such modern and functional zoning, it should be possible to guide the city toward a balanced and rational pattern of development.

Special Studies

INTRODUCTION

The Mayor's Committee staff undertook several studies of a special nature which, with the exception of the Public Property and Non-Residential Area Surveys, are discussed in other chapters of this volume and in Part III of the City-Wide Studies. Most of these studies supplement or involve investigations that contributed factual material to the consideration of problems of a major character. The surveys of tax arrears and building activity between 1934 and 1938, for example, threw additional light on current trends in residential areas, and were of value in arriving at the Residential Conclusions.

The surveys of Public Property and of Non-Residential Areas do not directly supplement other studies and are, therefore, reported separately in this chapter. These two studies do, however, have a bearing on other investigations made for the Mayor's Committee and this series of reports would not be complete without a reference to the findings.

The two sections of this chapter, drafted from the original survey material for inclusion in this volume, have not heretofore been released for publication. The Public Property Inventory was completed in 1936. The field inspection for the Non-Residential Area Survey was made in 1936 and the maps and tabulations were completed during 1937.

PUBLIC PROPERTY

Back in 1934 the Mayor's Committee on City Planning adopted the general policy of confining its studies to those factors of fundamental importance which would throw light upon the essential pattern of the city as a whole, including the inter-relation between the development of private property and public works and services. It was recognized that public property, over which city officials exercise direct control, is of primary importance in any comprehensive study of the city.

The Public Property Inventory

The Chief Engineer's office of the Board of Estimate had already laid some of the groundwork, and Mr. Vernon Moon, then Chief Engineer, offered the cooperation of his staff and the facilities

of his office to the Mayor's Committee staff in obtaining necessary information. A portion of the Mayor's Committee staff, working in the Chief Engineer's office, made an inventory of all federal, state and city-owned property in New York City, with the exception of public streets, which were covered by a special survey. ⁽³⁸⁾

With the "Tax-Exempt List" of the City Record as a guide, each parcel was checked in the appropriate borough tax office and a plot sketch obtained from the tax maps. Mr. Moon's office made available printed cards, of a distinctive shade for each borough, giving space for the following information: Section or Ward Number; Volume of Tax Record; Block or Plot Number; Lot Number; Jurisdiction of City Department; and additional spaces for notation as to transfer of jurisdiction of the property. This information as well as the assessed value, and area in acres, was entered on a separate card for each parcel, and a plot sketch was drawn to scale on the back of the card. In some instances it was necessary to make field checks and to call upon various city departments for verification of the information obtained from the borough offices. When completed, the cards were filed by borough and by the municipal, state or federal agency having jurisdiction over each parcel of property.

This inventory, based upon the tax-exempt list of 1934, was unfortunately out-of-date when the inventory was completed in August 1935. It was obvious from the experience of this inventory that there were omissions and additions to the printed tax-exempt list, and it was, therefore, desirable to make the inventory more complete. Accordingly the inventory was revised as of January 1, 1936.

Use of Inventory

The Mayor's Committee staff then tabulated, from the revised card file, the acreage and assessed value of each parcel, arranging the data by borough, for the three main divisions of federal, state and city-owned property. In addition, the city properties were subdivided according to departmental jurisdiction. This information was placed on borough maps to show the location of each parcel of public property.

⁽³⁸⁾ See the chapter entitled "The Highway System", City-Wide Studies, Part II, *The Planning of Public Services for the City of New York*, Mayor's Committee on City Planning.

Federal properties were shown under the following headings, by means of symbols and color: Post Office, Treasury, Judicial, Customs, Military and Naval, Docks and Miscellaneous. Using the same technique, but with a different color, the State properties were indicated as Judicial, Administrative, Armory Board, Barge Canal, and Miscellaneous.

Employing distinctive symbols and several colors, each parcel of city and authority owned property was indicated on these borough maps according to jurisdiction of the following agencies: Plant and Structures; Water Supply, Gas and Electricity; Markets; Transportation; Port of New York Authority; Triborough Bridge Authority; Docks; Elementary and High Schools, and Colleges; Police and Fire Stations; Correction; Welfare; Health; Sanitation; Hospitals; Parks; Administrative Buildings; Court Houses; Libraries; Museums; Miscellaneous (mainly Borough Presidents) and properties held by the Sinking Fund.

In addition to the above mentioned public properties, the following types of privately owned tax-exempt properties were shown on the borough maps whenever their area exceeded 10,000 feet square: Cemeteries, Hospitals, Schools, Colleges, Churches, Orphanages, and Miscellaneous.

Due to the technique employed and to the considerable work involved, it was not feasible to publish these maps. The original color maps have, however, been invaluable for reference in general city-wide studies. The staff of the Chief Engineer of the Board of Estimate, using the card file and employing a technique similar to that described above, indicated public properties upon prints of the 600 foot scale official map.

The completed inventory was placed in the Chief Engineer's office and has proved to be a valuable reference for the various city departments seeking information on the departmental jurisdiction, location, or extent of public property.

Summary of Findings

The acreage of federal, state and city property is summarized in Table 19, by borough and for the entire city. The Mayor's Committee files also contain tabulations giving the area and assessed value of city-owned property by departmental jurisdiction in each borough. Figure 70 indicates graphically the extent of publicly owned property in New York City. Excluding land in streets, the 25,641 acres of public property account for practically thirteen percent of the city's area. While Manhattan contains the largest percent of its area (23.6%) in public property, Brooklyn leads the other boroughs in total area of publicly owned land with nearly 6,500 acres.

The 1936 assessed value of public property totaled slightly more than \$3,780,000, of which some 210 million represents federal, about 90 million state, and approximately 3,483 million city-owned property. The average assessed value per acre of publicly owned property in New York City was \$147,500. According to the Department of Taxes and Assessments, the assessed value of privately owned tax-exempt property was slightly more than 880 million dollars in 1936. From these figures it will be seen that the 1936 assessed value of publicly and privately owned tax-exempt real estate in New York City was in excess of \$4,663,000,000.

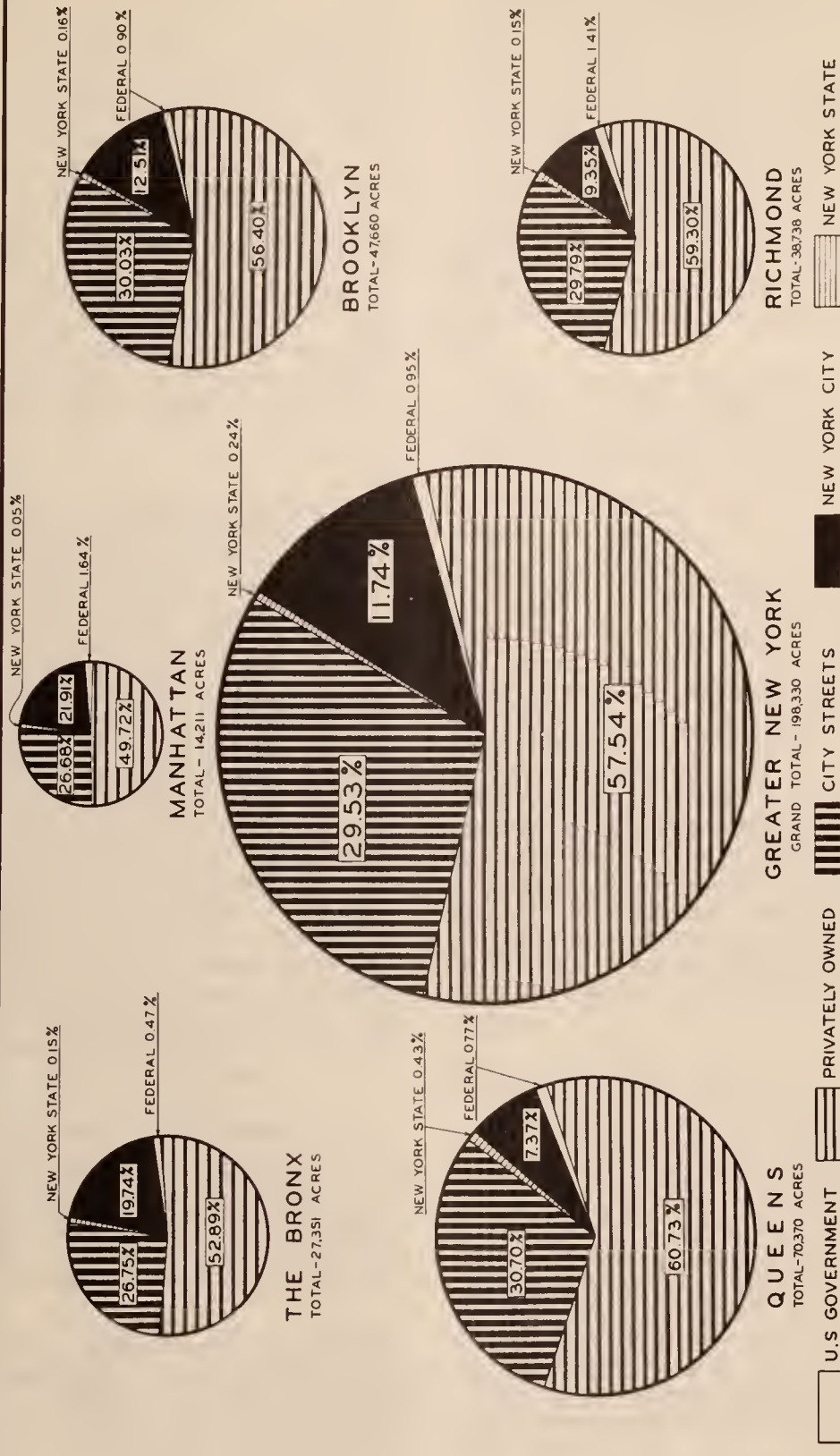
Aside from the value of this inventory for planning purposes, the use of the card file by city departments would suggest that the information should be continually kept up-to-date and made available in a central location. It would seem desirable therefore that a definite procedure be instituted whereby the Chief Engineer's office, or the City Planning Commission, be notified of each transfer of jurisdiction and new acquisitions of public property, so that revisions could be made as necessary and the inventory thus kept abreast of the constant changes in the status of public properties in New York City.

TABLE 19
Acreage of Publicly Owned Property in New York City—1936

Ownership	Manhattan	The Bronx	Queens	Kings	Richmond	City Totals
Federal	233.1	128.8	538.4	428.2	545.5	1,874.2
N. Y. State	6.5	40.1	305.3	74.2	54.7	480.8
New York City	3,114.4	5,401.3	5,185.0	5,961.6	3,623.8	23,286.1
Total	3,354.0	5,570.2	6,028.7	6,464.0	4,224.0	25,641.1

PUBLIC AND PRIVATE PROPERTY IN N.Y.C.

JANUARY 1ST 1936



ACREAGE OF PUBLICLY OWNED PROPERTY DETERMINED BY THE
MAYOR'S COMMITTEE ON CITY PLANNING

IN COOPERATION WITH THE CHIEF ENGINEER
BOARD OF ESTIMATE AND APPORTIONMENT

FIG. 70

THE HISTORY OF THE

NON-RESIDENTIAL AREA SURVEY

The preceding chapter entitled "Residential Areas" discusses the use of the 1934 Real Property Inventory in studies of the city's residential sections. This Inventory also reported upon the general character of the buildings in those areas designated by the Mayor's Committee staff as predominantly non-residential. Unfortunately, the Inventory data were not as complete for non-residential sections as for the residential areas and, in order to determine the character and condition of the former sections, it was necessary to obtain considerable additional information. This information had to be obtained directly from the field because there were no secondary sources containing sufficient data available to the staff.

The Field Survey

The predominant non-residential areas of each borough were divided into sections, with individual numerical designations. The non-residential areas in the boroughs of Manhattan and The Bronx were divided into eight major map sections, Brooklyn into ten sections, Queens into thirteen sections, and Richmond into nine sections. Each of the city's forty-eight major map sections comprise subdivisions that are not always co-terminous, but which are of sufficient size for convenient mapping. These sections were carefully inspected in the field; the actual use of land was noted, and the condition, height and occupancy of buildings enumerated for each lot in these areas. The field inventory was mapped, at a scale of one inch equals two hundred feet. These maps are described below. The acreage devoted to major uses was determined by careful planimeter measurement and the data for these sections were then summarized on separate copies of a special form on which land utilization by lot is classified according to the following groupings.

Parks and Cemeteries, and Existing Streets.

Business Uses include stores, offices, lofts, warehouses, garages, filling stations and parking lots. The special form shows the ratio of each use to all business land, as well as the number, physical condition and vacancy of structures by type of business.

Industrial Use comprises plants and land devoted to the manufacture of: food and beverages, clothing, textiles, chemicals (light, heavy and hazardous), glass, metal, wood products, tobacco, paper products, furniture, leather, jewelry, electri-

cal supplies, printing and publishing, vehicles and miscellaneous. In addition, it includes power plants, transportation yards and stations, and building material concerns. The special form shows the ratio of each use to all industrial uses, the ground area of buildings, the percentage of land in yards, and the number, condition and occupancy of establishments.

Vacant Land represents individual lots and blocks suitable for development, but without improvements and unused for any purpose; it also includes vacant land between the shore and bulkhead line which is not immediately suitable for use.

Public Buildings include all city, state and federal lands and buildings, exclusive of public parks and streets, as well as educational and recreational facilities.

Private Institutions include schools, churches, hospitals and the like.

Residential Use is subdivided according to type of building, namely, single-family, two-family, multi-family and miscellaneous dwellings (rooming houses, apartment hotels, residential clubs, etc.). Ground floor stores in residential buildings are noted; also the age, rent, condition, vacancy and population as reported by the 1934 Real Property Inventory.

The special form also shows the Zoning Use districts; railroad, waterfront and highway facilities; the number of workers (as reported by the 1934 Real Property Inventory); assessed value of land and improvements; and any particular advantages or disadvantages possessed by the particular area. This information was obtained from secondary sources and tabulated for each map section.

Non-Residential Area Maps

The mapping of the Non-Residential Survey, to show the actual uses by lot, presented difficult problems. Base maps on tracing cloth, at a scale of one inch equals two hundred feet, were made by photographic enlargement of the 600 foot scale city map. These enlargements were carefully matched and aligned to obtain a correct base map for each subdivision within the major map sections. Upon these base maps the staff indicated by appropriate symbols the use of each lot according to the major categories enumerated above; non-existent mapped streets were given a special designation.

When the tracings were finished, litho-prints were drawn and colored to emphasize the principal land uses. The staff determined the acreage in major uses, by planimeter measurement, summarized and entered the results on the special form described above.

Figure 71 shows the general character of these maps, including the symbols employed for the principal types of land use, as well as for building height, condition and vacancy. This particular illustration is taken from a portion of the map covering Area 5 in Manhattan. An examination of Figure 71 will reveal the extent of the information contained on these maps.

Land Uses in Non-Residential Areas

The data contained on the special survey forms were summarized and analyzed for the boroughs and the entire city. The series of pie charts in Figure 72 reveal the proportion of land devoted to the major uses found in the Non-Residential Areas, as well as the relative size of these Areas in the several boroughs and the city. The acreage figures by borough are given in Table 20.

In Terms of Gross Area

As shown by Figure 72, industry is the largest user of land in these Areas, accounting for some 27 percent of the city's total non-residential acres. In Manhattan, 14 percent is industrial; in The Bronx, Brooklyn and Queens around 30 percent is used for industry; and in Richmond 40 percent.

Reference to Figure 72 will show that vacant land also accounts for a large proportion of gross acreage; one-quarter of the acreage in Non-Residential Areas was vacant and unused. Vacant lots and blocks in Manhattan were a smaller part of gross area (3.4%) than in any other borough; about one-quarter of The Bronx's Non-Residential Areas were vacant, nearly one-fifth of Brooklyn's, almost a third of Queens', and 40 percent of Richmond's. The extent of vacant land in these Non-Residential Areas seems to indicate that there is considerable acreage available for future expansion of business and industry.

Streets account for one-fifth of the gross acreage of New York's Non-Residential Areas, but there is considerable variation among the boroughs in the percentage of street land. Streets take nearly 37 percent of the land in Manhattan; approximately a fifth of the acreage in The Bronx, Brooklyn and Queens; and only 9 percent of Richmond's Non-Residential acres.

Category	Manhattan			The Bronx			Brooklyn			Queens			Richmond			New York City		
	Acres	% of Usable	% of Gross	Acres	% of Usable	% of Gross	Acres	% of Usable	% of Gross	Acres	% of Usable	% of Gross	Acres	% of Usable	% of Gross	Acres	% of Usable	% of Gross
Business	1,082.5	49.7	30.3	216.7	8.0	5.9	434.3	11.6	8.6	285.0	5.9	4.7	69.7	2.2	1.5	2,088.2	11.8	9.2
Industry	501.6	22.9	14.0	1,180.3	43.8	32.0	1,508.3	40.3	30.2	2,097.0	42.8	34.7	890.2	28.6	20.5	6,177.4	35.0	27.2
Net Non-Residential	1,584.1	72.6	44.3	1,397.0	51.8	37.9	1,942.6	51.9	38.8	2,382.0	48.7	39.4	959.9	30.8	22.0	8,265.6	46.8	36.4
Vacant Land *	121.5	5.6	3.4	995.8	30.4	27.0	956.3	25.6	19.2	1,927.7	39.4	31.9	1,771.7	30.3	40.6	5,773.0	32.8	25.5
Institutions	187.1	8.6	5.2	322.6	11.9	8.7	598.1	15.9	11.9	176.5	3.6	2.9	995.5	31.7	23.0	2,279.8	12.9	10.1
Residential	287.2	13.2	8.0	158.9	5.9	4.3	246.6	6.6	4.9	405.3	8.3	6.8	225.5	7.2	5.3	1,323.5	7.5	5.8
Net Usable	2,179.9	100.0	60.9	2,874.3	100.0	77.9	3,743.6	100.0	74.8	4,891.5	100.0	81.0	3,952.6	100.0	90.9	17,641.9	100.0	77.8
Parks & Cemeteries	81.3	...	2.3	45.7	...	1.2	101.4	...	2.0	44.3	...	0.7	18.5	...	0.4	291.2	...	1.3
Streets	1,317.4	...	36.8	771.2	...	20.9	1,164.0	...	23.2	1,107.1	...	18.3	369.7	...	8.7	4,729.4	...	20.9
Gross Area	3,578.6	...	100.0	3,691.2	...	100.0	5,009.0	...	100.0	6,042.9	...	100.0	4,340.8	...	100.0	22,662.5	...	100.0

*Includes vacant lots and blocks, land between shore and bulkhead lines, and mapped streets that did not exist.

LAND USES IN NON-RESIDENTIAL AREAS

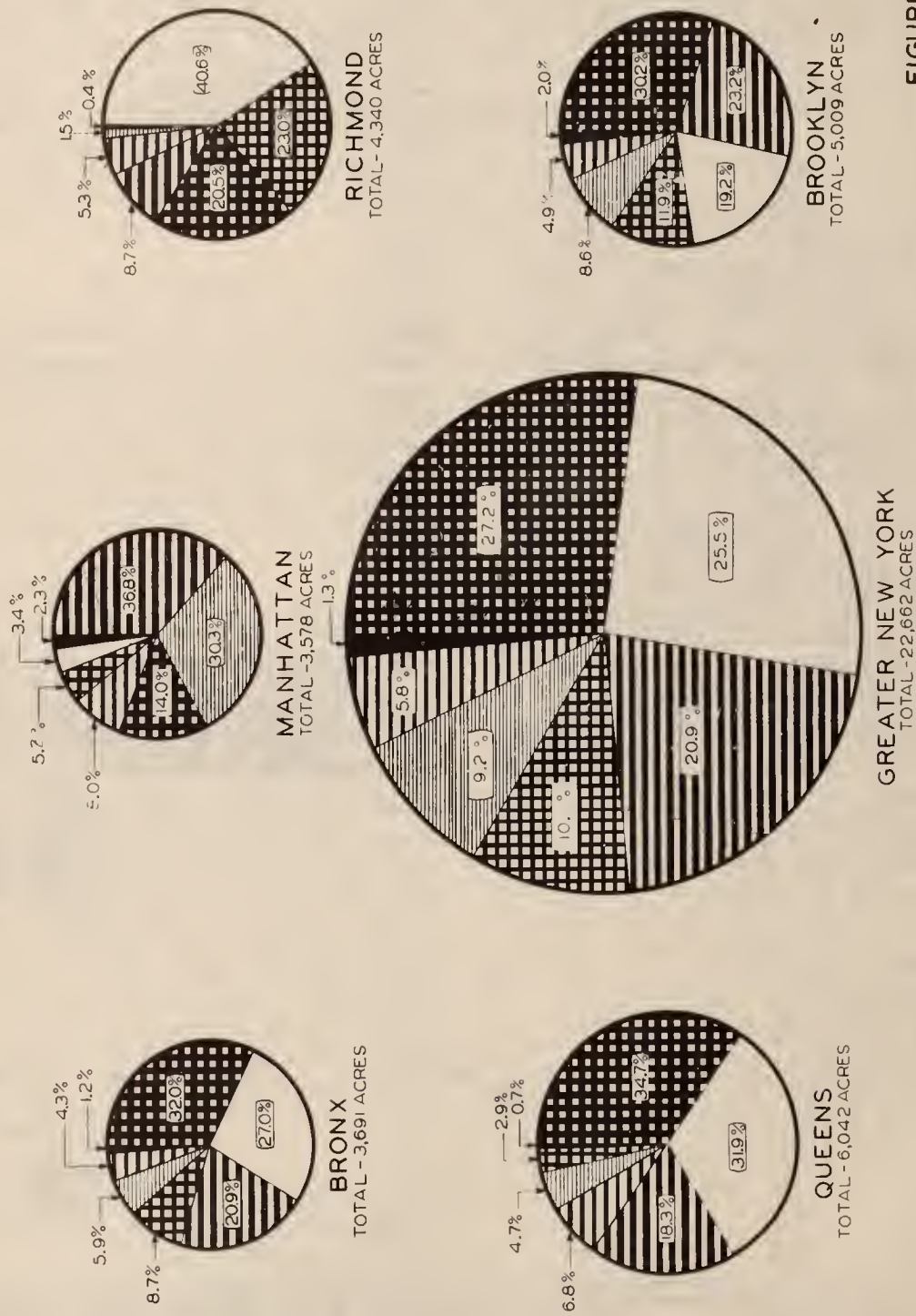


FIGURE 72

MAYORS COMMITTEE ON CITY PLANNING
1936 SURVEY OF PREDOMINANT NON-RESIDENTIAL
AREAS IN NEW YORK CITY
WPA PROJECT 319-X

PUBLIC & PRIVATE INSTITUTIONS
PARKS & CEMETERIES
RESIDENCE

INDUSTRY
UNDEVELOPED
STREETS
BUSINESS

Public Buildings and Private Institutions together occupy 10 percent of New York's Non-Residential acreage. In Table 20 and on Figure 72 these uses are grouped together under the heading of "Institutions". Richmond's institutions account for almost one-quarter of the gross acres in these Areas, but a smaller proportion of land is used for these purposes in the other boroughs, ranging from 3 percent in Queens to 12 percent in Brooklyn.

Business, as defined above, occupies less than 10 percent of the city's Non-Residential acres. In Manhattan, however, business uses take nearly one-third, in The Bronx about 6 percent, under 9 percent in Brooklyn and 5 percent in Queens, and only 1.5 percent of the gross acreage of these Areas in Richmond.

Residences account for less than 6 percent of the gross acreage in the city's Non-Residential Areas, which, with the exception of parks and cemeteries, is a smaller proportion than any other category. In Manhattan 8 percent is used for residence, nearly 7 percent in Queens, and approximately 5 percent of the gross acres in the other boroughs is occupied by dwellings.

Figure 72 shows that Parks and Cemeteries together account for less than 2 percent of the city's Non-Residential acreage. At a maximum of 2.3 percent in Manhattan and less than one percent in Richmond and Queens, these categories are relatively insignificant uses in the Areas of individual boroughs. See Table 20.

In Terms of Usable Acres

Figure 72 shows the relative extent of the principal uses in Non-Residential Areas in terms of gross acreage. In addition to percent of gross area and the actual acreage devoted to each use, Table 20 indicates the "net usable" area. In the sense that parks, cemeteries and streets are ordinarily not used for any other purpose, these uses are fixed and are therefore excluded from "net usable" acreage. Thus "net usable" acres may be defined as the land utilized and available for development or improvement in these Non-Residential Areas.

The figures summarized in Table 20 reveal that the net usable area is slightly more than three-quarters of the gross acreage of New York's Non-Residential Areas. Net usable land in the boroughs ranges from 60 percent in Manhattan to 90 percent of Richmond's Non-Residential gross acreage. In other words, Parks, Cemeteries and Streets occupy a larger proportion of the Non-

Residential acres in Manhattan and the smallest percent in Richmond, which is indicative of the relative character of development in the boroughs.

Net Non-Residential. Business and industrial uses, which together are termed "net non-residential", account for about 47 percent of the city's usable land in Non-Residential Areas. The great concentration of commercial and manufacturing activity in Manhattan is shown by the high ratio of net non-residential to usable acres, namely 72.6 percent; in the other boroughs net non-residential uses occupy from 31 percent of Richmond's to 52 percent of The Bronx's and Brooklyn's usable land.

Vacant Land. Table 20 shows that the 5,773 acres of vacant land represent practically one-third of the net usable land in New York's Non-Residential Areas. There are some 1,000 acres of land lying between the shore and bulkhead lines, which is below mean high water. ⁽³⁹⁾ This land, equivalent to 4.5 percent of the gross acreage and about 18 percent of all vacant land in Non-Residential Areas, would have to be filled or otherwise reclaimed if it were to be developed for active use. Hence, only the vacant land above mean high water is immediately available for improvement; it is 21 percent of the gross and about 28 percent of the net usable acreage in these Areas.

Allowing 1,320 acres which may be needed for new streets, there would be 3,380 acres of the 4,700 odd acres of vacant land immediately available for commercial and industrial purposes. This additional acreage would appear to be more than adequate to accommodate any future expansion of economic activities in the city's Non-Residential Areas.

Institutions. It is probable that certain types of institutions will and should remain in Non-Residential Areas; they now occupy 13 percent of the net usable acres in the city's, and varying proportions (from 8.6 percent in Manhattan to 32 percent in Richmond) of the usable land in the boroughs' Non-Residential Areas.

Residence. Residential uses were found to take up 7.5 percent of the usable acres in the city's Non-Residential acres. Of the boroughs, Manhattan had the largest amount of residence in relation to usable acres, namely 13.2 percent; residence in the other boroughs ranged from 6 percent

⁽³⁹⁾ The greater part of this vacant land "under water" is situated in Richmond (about 800 acres) with smaller amounts in The Bronx, Brooklyn and Queens; there is practically no land between the shore and bulkhead lines in Manhattan.

of the net usable acres in Brooklyn to 8.3 percent in Queens. The 1934 Real Property Inventory reported that more than 230,000 persons were living in dwellings which are located in the city's Non-Residential Areas.

Business Uses in Non-Residential Areas

The staff also analyzed the special tabular forms of the survey to ascertain the character and extent of business uses in these Areas. Table 21 summarizing this analysis shows the number and type of business structures in the Non-Residential Areas of the boroughs and the entire city. It also indicates the percent of the business acres devoted to each type of business.

In Terms of Structures

An examination of the figures in Table 21 reveals that of all business structures in New York's Non-Residential Areas, the largest number, some 44 percent, was loft buildings; and the second largest number of structures, namely 22 percent, was garages and filling stations. Store and office buildings, and warehouses were each about 11 percent of all business structures.

The relationships between the number of structures of various types fluctuate among the individual boroughs; like the entire city, Manhattan has a predominance of loft buildings; in The Bronx, Brooklyn and Queens garage and filling stations structures are in the lead; and Richmond is the only borough with a majority of store buildings.⁽⁴⁰⁾ An inspection of Table 21 will also show the exact number of structures enumerated for each type of business in the several boroughs.

In Terms of Land Area

Table 21 gives the percent of business acreage (for actual acreage see Table 20) devoted to each type of business use. Loft buildings occupy the largest amount of business land, namely about 30 percent. Garages and filling stations are a close second, accounting for one-quarter of the business land in Non-Residential Areas. Next in order come warehouses with 18.6 percent, office buildings with 13.5 percent, store buildings with some 8 percent, and parking lots occupy 5 percent of the net business acreage of the city's Non-Residential Areas. Garages, filling stations and parking lots together used 30 percent of the business land in the city's Non-Residential Areas!

(40) The store structures shown in Table 21 do not, of course, include stores in the ground floor of residential buildings or other types of business and industrial structures.

Type of Business	Manhattan		The Bronx		Brooklyn		Queens		Richmond		City Total	
	Number of Structures (1)	% of Area (2)	Number of Structures (1)	% of Area (2)	Number of Structures (1)	% of Area (2)	Number of Structures (1)	% of Area (2)	Number of Structures (1)	% of Area (2)	Number of Structures (1)	% of Area (2)
Store Buildings	249	3.4	268	15.0	363	8.9	383	15.1	139	18.5	1,402	7.9
Loft Buildings	4,984	48.5	181	8.1	497	13.1	113	8.3	10	2.0	5,785	29.9
Office Buildings	1,118	21.5	78	4.3	175	4.7	110	6.1	21	3.0	1,502	13.5
Warehouses	795	10.8	130	13.4	364	38.1	125	15.0	34	47.5	1,448	18.6
Garage and Gas Stations	934	13.7	474	52.3	733	29.7	613	40.5	112	23.0	2,866	25.0
Parking Lots	...	2.1	...	6.9	...	5.5	...	15.0	...	6.0	...	5.1
Totals	8,080	100.0	1,131	100.0	2,132	100.0	1,344	100.0	316	100.0	13,003	100.0
Vacancy in Business Buildings		8.0%		5.7%		10.2%		4.9%		7.0%		7.8%

Note: (1) Number and type of structures, based upon field inspection, indicates predominant use of each structure.
(2) % of Area is the proportion of land occupied by each type of Business Use to the total Business Acres shown in Table 20.

Store buildings occupy 15 percent and more of the business land in The Bronx, Brooklyn, Queens and Richmond, but are under 4 percent of Manhattan's business acreage. In Manhattan, loft buildings occupy almost one-half of the business land, but a much smaller proportion in the other boroughs. Office buildings are greater in number and take up a larger ratio (21.5 percent) of Manhattan's business land than in the other boroughs; the percentage ranges from 3 in Richmond to 6 in Queens.

Warehouses account for almost one-half of Richmond's business land, about 38 percent in The Bronx, and smaller proportions in the other boroughs. For the actual acres devoted to warehouses, compare the figures in Tables 20 and 21. Garages and filling stations occupy a substantial proportion of the business land in every borough, ranging from 13.7 percent in Manhattan to 52.3 percent in The Bronx.

If parking lots are grouped with garages and filling stations, we find that these land uses predominate in The Bronx and Queens, occupying 59.2 percent in the former and 55.5 percent of the business acreage in the latter borough! In Manhattan these combined automotive service activities take 16 percent, in Richmond 29 percent, and in Brooklyn 35 percent of the net business land. The ratios suggest the extent of the demand for land that has been generated by the ubiquitous automobile and truck.

Industrial Uses in Non-Residential Areas

The staff analysis of the industrial uses in Non-Residential Areas is summarized in Table 22 according to the number of plants and the ratio of industrial land used by the various types of activities.

In Terms of Plants

The number of buildings shown in Table 22 is actually the predominant use of industrial structures as revealed by the staff field survey. The number of buildings does not correspond with the number of establishments reported by the New York State Department of Labor, or by the Census of Manufactures, since more than one establishment may be located in the same structure.

A brief examination of Table 22 reveals that of the activities classified in the field survey as industrial, the ten groups with the largest number of buildings represent 90 percent of all industrial structures. The remaining eleven groups predominate in only 9 percent of the industrial buildings.

The first ten industrial activities in order of the number of plants were Miscellaneous, Metals, Foods and Beverages, Wood Products, Building Materials, Transportation, Heavy Chemicals, Vehicles, Power, and Furniture.

In the boroughs, Miscellaneous structures also lead in number, but the sequence found for the entire city does not otherwise hold. The figures in Table 22 show the reported relationship of the number of structures in each borough.

In Terms of Land Area

Table 22 also shows the percent of Industrial acres (for actual acreage see Table 20) occupied by each type of industrial activity. For the entire city's Non-Residential Areas, the first ten activities, in order of the relative amount of land used, are: Transportation, Miscellaneous, Power, Metals, Wood Products, Food and Beverages, Building Materials, Heavy Chemicals, Hazardous Chemicals, and Vehicles. Together these ten activities account for nearly 95 percent of the net acres used for Industrial purposes.

The first ten activities, measured in terms of the number of buildings, and in terms of land area are, with two exceptions, identical for the city. Furniture, tenth in order of number of buildings, is eleventh in land area; and Hazardous Chemicals with relatively few plants is number nine as a user of industrial land.

A considerable number of interesting comparisons of relative industrial importance can be made in the case of individual boroughs, but the resulting exploration is more descriptive than helpful in analyzing industrial activity. The chapter of this volume entitled "Status and Trends of Industry" should be consulted for reports upon manufacturing industry. A further examination of Table 22 will, however, reveal the relative significance of the several industrial activities as users of land and structures.

Institutions and Residence

Table 20 shows the acreage used by "Institutions", which comprise public buildings and private institutions as previously defined. Table 23 contains, among other data, a breakdown of the number of structures under each category, as well as the acreage devoted to public buildings and to private institutions.

Public buildings represent a larger number of structures in the city's and the boroughs' Non-Residential Areas than do private institutions;

TABLE 22

Industrial Uses in Predominant Non-Residential Areas—1936
(Based on Field Inspection and Measurement of Scale Maps)

Industrial Group	Manhattan		The Bronx		Brooklyn		Queens		Richmond		City Totals	
	Number of Buildings (1)	% of Area (2)	Number of Buildings (1)	% of Area (2)	Number of Buildings (1)	% of Area (2)	Number of Buildings (1)	% of Area (2)	Number of Buildings (1)	% of Area (2)	Number of Buildings (1)	% of Area (2)
Food and Beverage	134	8.2	53	1.5	386	5.4	104	4.3	12	2.6	689	4.1
Clothing	9	0.4	5	0.1	30	0.6	14	0.2	3	(*)	61	0.3
Textile	10	0.5	5	0.1	10	0.3	2	0.1	2	0.8	29	0.3
Chemical—light	8	0.5	5	0.1	7	0.2	8	0.1	...	...	28	0.1
Chemical—heavy	18	0.4	16	0.4	78	3.1	48	1.6	10	14.2	170	3.5
Chemical—hazardous	5	0.2	2	0.3	29	1.0	9	(*)	4	8.9	49	1.6
Glass	6	0.2	3	0.1	12	0.3	5	0.3	...	...	26	0.2
Metal and Allied	135	4.5	118	6.2	277	11.6	176	7.3	23	12.3	729	8.6
Wood Products	68	3.5	67	5.2	167	10.1	92	6.2	7	1.7	401	6.1
Tobacco	5	0.2	1	(*)	2	(*)	...	...	...	...	8	(*)
Paper Products	27	0.9	6	0.1	22	0.5	13	1.0	...	...	68	0.5
Furniture	14	0.2	2	0.3	39	1.4	27	0.7	4	(*)	86	0.6
Leather	5	0.1	1	(*)	3	(*)	1	(*)	...	...	10	(*)
Jewelry	1	(*)	...	...	1	(*)	...	...	...	...	2	(*)
Power	36	9.6	18	9.8	29	11.6	16	16.0	3	0.8	102	11.0
Transportation	47	44.9	45	57.4	46	21.1	51	42.9	13	38.9	202	39.9
Electric Supplies	10	1.4	6	0.1	10	0.6	11	0.2	...	...	37	0.3
Printing and Publishing	32	1.6	5	0.4	11	0.3	15	0.1	1	(*)	64	0.4
Vehicles	24	2.1	36	1.2	17	0.1	34	1.2	4	(*)	115	0.9
Building Material	27	2.0	56	5.2	87	3.8	70	3.0	11	4.2	251	3.7
Miscellaneous	311	18.5	169	11.1	496	27.8	359	14.5	75	15.4	1,410	17.5
Totals	932	100.0	619	100.0	1,759	100.0	1,055	100.0	172	100.0	4,537	100.0
Vacancy in Structures	5.0%		5.3%		6.0%		4.6%		14.0%		5.7%	

(1) Number and type of building, based upon field inspection, indicates predominant use of each structure.

(2) % of Area is the proportion of land occupied by each industrial group to the total acres shown in Table 20.

(*) Less than one-tenth of one percent.

with the exception of Manhattan and Richmond. For the city and the boroughs, public buildings also occupy more land than private institutions, with the one exception of Richmond.

The actual net acreage used for residences in Non-Residential Areas is given in Table 20. The number of residential buildings, the percent of family quarters vacant and the persons living in the Non-Residential Areas of the boroughs and city, are summarized in Table 23. A reference to this tabulation will show that Queens has the largest number of buildings, but ranks third in population. Manhattan is second in number of buildings, but leads in population, with 46 percent of the 236,362 persons reported as living in these Areas of the city in 1934. The majority of the buildings in Manhattan's Non-Residential Areas are of course multi-family, while single and two-family dwellings predominate in Queens.

Working Population and Assessed Values

The 1934 Real Property Inventory also enumerated the Daytime Population, which is defined as the persons regularly working in a structure or an area, regardless of place of residence. Since it does not include transients in hotels, school children, nor visitors to office buildings, the Daytime Population may be considered synonymous with "working" population.

The total working population of New York City was reported at approximately 2,140,000 persons as of 1934. Table 23 indicates that more than 1,320,000 persons, or about 62 percent of the total working population, were found in the city's Non-Residential Areas. The balance of the total working population was scattered throughout the city's predominant Residential Areas.

Manhattan's Non-Residential Areas had 83 percent, Brooklyn's about 9 percent, Queens' 4 percent, The Bronx around 3 percent, and Richmond less than one percent of the 1,323,822 workers in these Areas. The extent of the heavy concentration of working population in Manhattan is clearly indicated by the density figures in Table 23. Manhattan had practically 700 workers per non-residential acre, which was 4.3 times the city average of 160 workers per non-residential acre. The magnitude of Manhattan's density is further shown by comparison with the other boroughs: the concentration of workers per non-residential acre in Manhattan was 27 times The Bronx Density, 11 times Brooklyn's, 30 times Queens' and 76 times the number of workers per acre in Richmond's Areas!

Assessed Values

The 1934 assessed valuation of taxable properties in New York's Non-Residential Areas, also summarized in Table 23, aggregated nearly 5 billion dollars. ⁽⁴¹⁾ Of this total, Manhattan accounts for over three-quarters, Brooklyn some 11 percent, The Bronx and Queens less than 6 percent each, and Richmond under one percent.

Table 23 also shows the ratio of assessed value of land to the total valuations; land in the city's Non-Residential Areas averaged about 68 percent of total assessed value. The relatively higher building values in Manhattan are indicated by the lower ratio of land to total assessed value, namely 55.7 percent; in Richmond, land was only one-half of the total assessed value; and the land ratio is from 63 percent to 78 percent in the other boroughs.

The assessed value per net usable acre is a good indicator of the greater concentration and higher values in Manhattan's Non-Residential Areas. The figures in Table 23 show that the assessed value per net usable acre in Manhattan was over 6 times the city average; almost 300 times the Richmond, 30 times the Queens, 19 times The Bronx, and 11 times the value per acre in Brooklyn!

Summary of Findings

The analyses discussed above reveal the actual amount of land devoted to the principal uses, as well as the percentages in terms of gross and net usable acres in Non-Residential Areas. As might be expected, the survey shows that business and industry occupy the largest proportion of both the gross (namely 36 percent) and of the net usable acres (nearly 48 percent) in the city's Non-Residential Areas.

One of the outstanding facts brought to light is the considerable amount of vacant land (one-quarter of the gross area, and one-third of the net usable acreage) which was lying idle in 1936. After deducting the land between shore and bulkhead lines and allowing for new streets in undeveloped sections, there are some 3,380 acres of unused land (one-fifth of the gross and 28 percent of the usable acres) but immediately available

(41) Figure 3 in *Programming Public Improvements in the City of New York*, Part III of the City-Wide Studies of the Mayor's Committee on City Planning, shows that the assessed value of Non-Residential Areas was 30 percent of the city's total assessed valuation in 1934; but in Manhattan they were 45 percent of the borough total. The assessed value of Non-Residential Areas in the other boroughs ranged from 8 percent in Richmond, to 15 percent in Brooklyn, of the total borough assessed valuations.

TABLE 23 Public Buildings, Private Institutions, Residential Data, Working Population and Assessed Values in Predominant Non-Residential Areas—1936 (*)												
Category	Manhattan		The Bronx		Brooklyn		Queens		Richmond		City Totals	
	Number of Structures	Acres	Number of Structures	Acres	Number of Structures	Acres	Number of Structures	Acres	Number of Structures	Acres	Number of Structures	Acres
Public Buildings	153	100.4	107	178.2	148	518.4	94	128.1	48	473.7	550	1,398.8
Private Institutions	230	86.7	57	144.4	65	79.7	70	48.4	75	521.8	497	881.0
Residential (1)												
(a) No. of Buildings		4,506		1,625		4,311		5,103		2,110		17,655
(b) Vacancy in FQ		25.7%		12.5%		17.7%		13.1%		15.0%		20.2%
(c) Population		108,804		35,602		46,844		35,558		9,554		236,362
Working Population												
(a) Number (2)		1,101,976		35,196		122,589		55,309		8,752		1,323,822
(b) Persons/NR Acre		697.8		25.2		63.1		23.2		9.1		160.2
Assessed Value												
(a) Total (3)		\$3,801,243,168		\$262,005,778		\$575,832,553		\$281,716,100		\$23,396,287		\$4,944,193,886
(b) % Land of Total		55.7%		64.4%		62.7%		78.0%		50.0%		67.9%
(c) Value per Net Usable Acre		\$ 1,743,750		\$ 91,850		\$ 153,800		\$ 57,590		\$ 5,900		\$ 280,252
(*) All data taken from 1936 Field Survey unless otherwise noted.												
(1) Vacancy in Family quarters and Population based on 1934 Real Property Inventory.												
(2) Working Population based on 1934 Real Property Inventory.												
(3) Assessed valuations are for the year 1934.												

for expansion of the business and industrial area by 1.4 times the 1936 acreage, within the city's Non-Residential Areas.

The survey also reveals that residences occupy a relatively minor proportion of these Non-Residential Areas. The findings of the Residential Areas study show, however, that the suggested future residential pattern could more than adequately house the city's probable ultimate population. This conclusion is based, among other considerations, on turning over about 200 acres of residential areas, which were found to be declining due to the influx of commercial activities, to business and industrial uses. These findings do not indicate any pressing future need to retain other than the "miscellaneous" type of residential structures (hotels, etc. to accommodate transients) in Non-Residential Areas. ⁽⁴²⁾

According to the 1934 Real Property Inventory, about 43 percent of the family quarters in dwellings, which occupied the 1,323 acres devoted to residence in Non-Residential Areas, were in multi-family buildings, and less than 6 percent were in miscellaneous dwellings; the balance of family quarters was almost equally divided between single and two-family houses. In 1934 less than 80 percent of these dwelling units were occupied; buildings generally were in poor condition and rents in the lower brackets. If the majority of the 236,362 persons reported living in these Areas in 1934 can be more satisfactorily housed in Residential Areas, it would permit the demolition of the most unsuitable residential structures and the utilization of a large part of the 1,323 residential acres in Non-Residential Areas for appropriate business and industrial uses.

The Zoning Study, made by the Mayor's Committee staff, proposed the exclusion of residences from districts zoned for industry. ⁽⁴³⁾ On this basis we might assume that the 200 odd acres in "declining" residential areas would be eventually added to the city's Non-Residential Areas. Allowing 30 percent for streets, this shift in use would add about 120 net usable acres to Non-Residential Areas.

(42) See the chapter in this volume entitled "Residential Areas" for a description of the factors used and the resulting residential pattern suggested by the study.

(43) See the chapter in this volume entitled "Zoning" for a discussion, and an outline, of the provisions suggested for a proposed new zoning ordinance for New York.

Potential Increase of Net Usable Land

With the 3,380 acres of land now vacant in the several boroughs, assumed immediately available for business and industry, plus a large part of the residential land which might be cleared of unsatisfactory dwellings, there would be nearly 4,400 additional acres in Non-Residential Areas available for expanding economic activities. These additional net acres are about one-quarter of the "net usable" land, but they do not of course increase the 17,641 acre city total of net usable land shown in Table 20, since they represent merely a shifting of uses within this total. As a matter of fact, there would be a decrease of 1,320 acres, assumed needed for new streets in undeveloped sections, and an increase of 120 acres from declining residential areas, which would reduce net usable to 16,540 acres and, at the same time, provide a total of 4,500 net acres in Non-Residential Areas for expansion under these suppositions.

Outside of the general study of industry reported in this volume, it was, unfortunately, beyond the scope of the Mayor's Committee program to undertake studies of the city's present and probable future position in the manufacturing, distributive, financial, service and cultural activities of the nation, and in relation to international conditions. The City Planning Commission will doubtless make such investigations in due course. Until such studies have been made, we can only draw general conclusions.

The full utilization of vacant land plus the shift in use of residential land would make available a total of more than 12,700 net usable acres for the non-residential uses. Thus the future economic activities of the city would have at their disposal 1.5 times more *usable* acres, within Non-Residential Areas, than were actually used for business and industry in 1936.

The foregoing is not intended to imply that the future city will actually require all of the 12,700 acres of usable land for commercial and manufacturing purposes. A rough indication of future land needs is afforded by the 1.3 ratio of the probable ultimate to the 1934 population. Such comparisons obviously are not conclusive, but they do lead to the belief that the Non-Residential Areas here studied will provide sufficient usable land to meet all of the economic needs of the future city.

1. The first part of the paper discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for the success of any business or organization. The author argues that without reliable records, it is impossible to make informed decisions or to identify areas for improvement.

2. The second part of the paper focuses on the challenges of record-keeping in a rapidly changing environment. The author notes that new technologies and regulations can make it difficult to keep records up-to-date and accurate. However, the author also points out that these challenges can be overcome with the right tools and processes. The paper provides several examples of how businesses have successfully implemented record-keeping systems.

3. The third part of the paper discusses the benefits of record-keeping. The author argues that accurate records can help businesses to identify trends, make better decisions, and improve their overall performance. The paper also mentions that good record-keeping can be helpful in legal disputes and in meeting regulatory requirements.

4. The fourth part of the paper provides some practical advice for businesses looking to improve their record-keeping. The author suggests that businesses should invest in good record-keeping software and that they should train their employees on how to use the software correctly. The paper also recommends that businesses should review their records regularly to ensure that they are accurate and up-to-date.

5. The fifth part of the paper discusses the importance of record-keeping for small businesses. The author notes that small businesses often have limited resources and may find it difficult to keep records. However, the author argues that record-keeping is even more important for small businesses because they have fewer resources to make up for poor record-keeping. The paper provides several tips for small businesses to make record-keeping easier.

6. The sixth part of the paper discusses the importance of record-keeping for non-profit organizations. The author notes that non-profit organizations often have a lot of transactions and may find it difficult to keep records. However, the author argues that record-keeping is essential for non-profit organizations because it helps them to ensure that they are using their funds properly and to report on their activities accurately. The paper provides several examples of how non-profit organizations have successfully implemented record-keeping systems.

7. The seventh part of the paper discusses the importance of record-keeping for government agencies. The author notes that government agencies have a lot of transactions and may find it difficult to keep records. However, the author argues that record-keeping is essential for government agencies because it helps them to ensure that they are using public funds properly and to report on their activities accurately. The paper provides several examples of how government agencies have successfully implemented record-keeping systems.

8. The eighth part of the paper discusses the importance of record-keeping for educational institutions. The author notes that educational institutions have a lot of transactions and may find it difficult to keep records. However, the author argues that record-keeping is essential for educational institutions because it helps them to ensure that they are using funds properly and to report on their activities accurately. The paper provides several examples of how educational institutions have successfully implemented record-keeping systems.

Zoning

INTRODUCTION

The zoning studies undertaken by the staff of the Mayor's Committee on City Planning were of three types, (1) an examination of present zoning in relation to actual land utilization and modern techniques, (2) testing proposals for interim revision through building bulk restrictions, and (3) the preparation of an up-to-date zoning ordinance in outline form, and the application of proposed districts to maps of specific sections of the city.

The first type of study was the logical outgrowth of other city-wide investigations dealing with residential and non-residential areas, and with population and industrial trends. The second series of studies resulted from the joint action of a committee appointed by the City Club of New York and a zoning subcommittee of the Mayor's Planning Committee. This joint committee considered the immediate need for rezoning and proposed a method for limiting building bulk in all sections of the city. These recommendations were analyzed by the staff and an extensive series of building bulk diagrams were prepared to illustrate the height, coverage and bulk of structure that would have been permitted under this proposal for interim zoning.

The first two studies revealed a considerable divergence between actual land uses and the city's zoning districts, and clearly indicated the desirability of a careful examination of the possibilities for bringing zoning into line with current practice and probable future development. Following this explanation, the staff prepared a framework for a new zoning ordinance, which is discussed in this chapter.

These zoning studies were conducted during the period 1935 through 1937 and the original report was drafted in August 1938. Subsequent modifications of the zoning district maps and revisions in the Zoning Resolution, proposed by the City Planning Commission and approved by the Board of Estimate in 1940, affect certain of the data and conclusions of these studies. The more important changes are indicated by footnotes in the text.

THE BEGINNING OF COMPREHENSIVE ZONING

A generation ago a small group of enlightened officials and citizens of New York came to the conclusion that uncontrolled building development

was contrary to the best interests of property owners and to the general welfare of the city. Their efforts produced the Zoning Resolution, adopted in 1916, which for the first time in this country established comprehensive regulations for the use and bulk of buildings within specific districts, or zones, of the city.

During the past twenty years the people of city after city throughout the United States have come to look to their zoning ordinance as a protector of their property and a reasonable regulator of their city's growth. Today, virtually every important municipality and many thousands of villages have the benefits of zoning. While the City of New York led this movement, it has not followed up this lead, nor has it sought to profit by the progressive trend of zoning experience in other cities.

The Commission on Building Districts and Regulations, appointed in 1916, like the Heights of Building Commission which preceded it, was faced with many difficulties and doubts. They had to feel their way slowly as they pioneered an entirely new field of law and government. They were uncertain as to how far the courts would approve an experiment that was obviously going to be attacked on constitutional grounds. They wisely wrote into their Building Zone Resolution only those provisions which they felt reasonably assured that the courts, similarly confronted with new problems, would be willing to uphold. It is not surprising that the Commission felt constrained to caution both as to the extent and the methods they proposed for the control of building. In addition, there was in 1916 an almost complete lack of information and experience on which to proceed. Some of the data and premises then accepted as sound have since had to be drastically revised in the light of changing trends and conditions. A major revision has subsequently been forced upon the then assumed continuation of a rapid rate of population increase.

There is no longer any question as to the legality of zoning. Conceived within the police power and fairly applied, it has been sustained in innumerable court decisions as contributing to the health, safety and general welfare. Since 1916 the courts have progressively clarified the extent and methods by which zoning controls may safely be applied, so that whereas New York's Resolution proceeded a

good deal by negative indirection, modern zoning can achieve its ends by more positive means. The courts have now established that many provisions, which the Commission of 1916 did not include in the original ordinance may be applied to zoning, such as the demarcation of single-family districts, neighborhood store districts and, among other things, the direct regulation of population density and bulk of buildings, when authorized by enabling legislation.

The city's present Zoning Resolution is pitifully old-fashioned and behind the times. Such great advances have taken place in the legal status and techniques of zoning that a thorough reconsideration of the present zoning structure appears to be of paramount importance in any comprehensive city planning study.

Equally important is the fact revealed by other city-wide studies of the Mayor's Committee staff, that the present Zoning Resolution and maps are not related in any realistic way to the city's present use of land nor its probable future growth and needs. Many of the ideas held in 1916 as to vast increases in business and residential population have failed to materialize. With no probability of such increases now in view, there can be no need for almost unlimited business, industrial, and apartment house districts which are far in excess of indicated future needs.

Zoning As An Aid To City Planning

The usefulness of zoning in giving effect to a comprehensive city plan is obvious. In a sense city planning aims at the establishment of proper relationships between the several elements of a city. The public streets, buildings and services over which the city exercises direct control cannot be economically planned, constructed and operated unless the building development which they serve is rational and predictable within certain limits.

Assuming for the moment that all private development, both of residential buildings and of non-residential structures, were to conform to a preconceived city pattern, extraordinary economies in public expenditures could be effected. It would follow that streets could be limited in number, width and type of improvement to what is actually needed. Sewers, water mains and other services could similarly be planned and installed with a precision that would effect great savings, as compared with past practice. Outlays for transit, schools and other major items of equipment could also be rationalized.

It is too much to expect that any city will be built with such precision and resultant economy. It is not too much to expect that we may, however, through zoning and other reasonable controls, move a considerable distance in the direction of rational city growth, and enjoy the dividends in lower tax rates, more adequate services and finer cities, which such city building would yield.

THE PRESENT ZONING OF NEW YORK CITY

The zoning of the city, established under the original resolution of 1916 and in force at the time of this study, controls building and to some extent the use of unbuilt land through three sets of districts, shown on three separate maps. ⁽⁴⁴⁾

The *Use* map now contains five kinds of use districts: unrestricted, business, retail, restricted retail, and residential, in increasing order of restrictiveness. ⁽⁴⁴⁾

The *Area* map includes six kinds of districts, designated as A, B, C, D, E, and F, respectively, which by means of *yard*, *court* and *coverage* provisions, apply progressively greater restrictions on the percentage of land that may be covered by buildings. ⁽⁴⁴⁾

The *Height* map includes districts with eight different "times" designations as follows: $2\frac{1}{2}$, 2, $1\frac{1}{2}$, $1\frac{1}{4}$, 1, $\frac{3}{4}$, $\frac{1}{2}$, and $\frac{1}{4}$; the figures referring to the number of "times" the width of the street to which a property line wall may be erected. Further detailed provisions indicate the amount of additional height permissible in each district provided there are certain set-backs from the property line.

One of the first steps taken by the staff was the preparation of a city-wide map, at a scale of 2,000' to the inch, with the three sets of districts superimposed, and made distinguishable by the use of separate colors. From this map the combinations of restrictions effective in each part of

(44) The Zoning Resolution as amended by the City Planning Commission and modified by the Board of Estimate, effective June 28, 1940, added four new Use districts, namely *Local Retail*, *Business-1*, *Retail-1* and *Manufacturing Districts*. This revision included three new Area districts: *D-1 Districts* designed for single-family, row or group houses; *E-1 Districts*, for single-family, twin or duplex houses built with a party wall; and *F-1 Districts*, especially designed for low coverage and low bulk "garden" type apartments. The G District, included in the ordinance by amendment adopted June 1938, had not been applied to the Area map at the time this report was written. The amendment of June 1940 also included entirely new provisions limiting Height district exceptions in the vicinity of airports. For these and other provisions see the "Report and Resolution" of the City Planning Commission amending the Building Zone Resolution of the City of New York, adopted May 29, 1940, and the resulting "Zoning Resolution" modified by the Board of Estimate and effective June 28, 1940.

the city are readily apparent. It is, unfortunately, not feasible to include a reproduction of this color map in the report.

A tabulation of the Height and Area districts applicable to Residential sections only, revealed that there were 23 different combinations. These data are based upon measurements of the above mentioned 2,000-foot scale map. Taking into account the combinations of Area and Height districts in the other than Residence Use districts, it is evident that there would be a total of somewhere between 50 and 100.

This simple tabulation brings out the complexity of New York's zoning as applied to the zoning maps. Obviously there is no ready answer to the question: What can be done on a given tract of land under the zoning law? Only a careful analysis of the three sets of provisions applying to the particular parcel of land will reveal the regulations.

Shortcomings of Present Zoning

In pointing out deficiencies in our zoning, no criticism is intended of the work of the Commission members who drew the original ordinance and maps. They showed rare insight into the city's problems. Men of less imagination and courage would not have ventured so far into a new philosophy of urbanism. The shortcomings now evident may be laid, first, to the recognized fact that if pioneers in legislation demand the ideal they may achieve nothing; second, to the then necessity for regulation by indirect methods so as to avoid the danger of adverse court decision; and third, to changes in the city's needs, which time has brought about.

The regulation of *population density* and type of residential building solely by provisions for *height, coverage, and yard and court dimensions* has proved ineffective and unsatisfactory. This procedure of indirection has failed to hold population density to reasonable limits. The average density of population throughout the city was 35 persons per gross acre in 1934. The densities permitted under present zoning, however, range from about 250 persons, permissible in the more restrictive F district, to more than 1,000 persons per acre in the less restrictive districts. It should be noted that the ultimate population of the city is not now expected to exceed an average of 46 persons per gross acre. ⁽⁴⁵⁾

If fully developed the building bulk, permissible under present zoning, in existing residential areas could accommodate 77,000,000 residents. If the Use district maps were to be brought into line with actual uses, by greatly reducing the amount of business and increasing the residential land areas, some 273,000,000 residents could be accommodated without violating the zoning law. There is no validity in the notion that land in this city is so limited as to require dense forms of development. On the contrary, there is no reason why really ample light, air and open space need be denied to any type of dwelling.

A second shortcoming of present zoning is that the Area and Height restrictions applicable to residential buildings throughout Manhattan, most of The Bronx, and a considerable portion of Brooklyn, are meaningless. These zoning provisions are less restrictive in respect to building bulk than the Multiple Dwellings Law. For this reason any Height and Area combinations less restrictive than the C Area and 1¼ Height districts are generally without effect, so far residential buildings are concerned. Most of the population of the city lives in C-1¼ districts. Further, even if the restrictions in residential Use districts were adequate, they would not mean much, for at present three-fifths of the city's population lives in districts zoned for non-residential purposes.

A third fundamental weakness of the present Zoning Resolution is its failure to achieve adequate separation of mutually incompatible uses. The single-family home is not protected from intrusion of two-family or row houses and apartments. ⁽⁴⁶⁾ It seems that the Residence E and F Area districts were intended for one and two-family houses, but many colossal multi-family structures have been erected in these Area zones. This can be corrected in part, where not too late, by the application of a new single-family district.

The trend of modern housing is toward large scale developments, low land coverage and spacious open courts, but the zoning resolution has no district designed to encourage garden apartments. The F Area zone, which paradoxically occurs on the map almost exclusively in sections where single-family and two-family dwellings are the established and appropriate development, is a possible exception. ⁽⁴⁷⁾

⁽⁴⁶⁾ The Resolution as amended in 1940 makes provision for single-family house districts. See Footnote 44.

⁽⁴⁷⁾ The Resolution as amended in 1940 provides for a "garden" type apartment district. See Footnote 44. To date none of these new F-1 Districts have been applied to the Area map.

⁽⁴⁵⁾ See the "Population" chapter in this volume.

In the fourth place, the zoning Use map provides far too much land for business and industry—enough to accommodate 344,000,000 workers. At present, business and industry occupy about 10 percent of the city's land, but 63 percent is zoned for these purposes. Over 4,000,000 people live in sections of the city that are zoned for *non-residential* uses.

The present Zoning Resolution furthermore, does not distinguish closely enough between different kinds of business. In the "Business District", practically anything goes except heavy industry. Manufacturing is permitted in the "Retail District" and "Restricted Retail District", if it is incidental to a retail business; or if not incidental, provided it does not exceed five percent of the floor area. The ordinance is thus not sufficiently sensitive to different types of business use. ⁽⁴⁸⁾ Practically the entire residential population of Manhattan below 59th Street is living in business, retail, and unrestricted districts.

On the present Use map, the "Unrestricted Districts" are of two kinds: heavy industrial areas; and lands for which the Zoning Commission did not feel, back in 1918, that it could define any appropriate types of use. The non-residential studies carried on by the Mayor's Committee staff reveal that the acreage of these unrestricted districts, excluding vast tracts of unripe land and land under water, greatly exceeds any conceivable demand for industrial sites. These excessively zoned industrial districts can obviously have no attraction for residential building unless their zoning is changed. Such land can have no stable economic use until its status is clarified through appropriate zoning.

Summarizing the above four points: The Zoning Resolution does not hold population density within reasonable bounds; it does not deal adequately with the problem of excessive building bulk; it encourages a haphazard intermixing of residential building types; and it provides a fantastic over-supply of business and industrial land.

If zoning is to become the constructive force in the growth of the city that it is capable of being, a fresh start is needed. It should begin with a fundamental conception of the desirable land use pattern of the future city, including the location, the extent and special characteristics of industrial, business and residential sections. ⁽⁴⁹⁾ Once there

is a general understanding of these primary considerations, the zoning appropriate to various types of use can be determined. When this appropriate zoning is properly applied to maps, the city would benefit by the resulting rationalization of its functions and of its future building development.

STUDY OF INTERIM ZONING PROPOSALS

The studies described above reveal that the present Zoning Resolution, once a model ordinance, is now out of date and inadequate in its protection of both residential and non-residential sections of the city. During the last twenty years, great progress has been made in other cities throughout the country and the courts have gradually liberalized their interpretation of the police power as applied to zoning.

It appears to be a generally accepted opinion that the time has come for New York City to overhaul its zoning ordinance and to bring it up-to-date. A complete rezoning will, however, require considerable time, because of the technical work involved and the extensive public interpretation needed prior to its adoption. It was, therefore, necessary for the Mayor's Planning Committee to recognize the need and widespread sentiment in favor of some interim revisions of the present Building Zone Resolution which might have more immediate effect.

One such proposal was the work of a Special Joint Committee consisting of members of the Mayor's Committee on City Planning, appointed by the then President of the Board of Aldermen, Bernard S. Deutsch, together with members of the City Club of New York. After meeting regularly over a period of several months this committee, with the aid of competent technical advice, proposed a formula for bulk limitation of residential buildings, applicable directly to the zoning districts in the present law.

This formula was made the subject of extensive study by the staff, a complete set of analytical drawings being prepared to show the effect of such bulk limitations under all the circumstances faced under the present law.

Certain weaknesses were discovered, but after some refinement the formula served as the basis for the floor area ratio regulations suggested in the draft ordinance described in this report. The general effect is to bring the building bulk permissible under zoning into a better relationship to the real needs of the city.

The greatest defect of the Joint Committee's formula was necessarily its application to the

(48) The Resolution as amended in 1940 goes further in the separation of non-residential uses. See Footnote 44.

(49) The Residential Area Analysis and the Non-Residential Area survey made by the staff produced a sound framework for forecasting a desirable city pattern.

present zones, so many of which are illogical. For this reason, among others, the Mayor's Committee on City Planning considered it best not to push for enactment of a purely interim measure before the official Planning Commission had an opportunity to give detailed study to the whole subject of zoning revision. A sweeping interim bulk regulation, admittedly imperfect, might readily produce situations of manifest individual hardship, which if taken into court would result in adverse decisions on the ground that the provisions were arbitrary and not based upon sufficiently comprehensive study.

Other interim or permanent provisions under the present law might be considered, along the lines of the new G Area district, promulgated by the City Planning Commission specifically for single-family houses. Indeed it is conceivable that a permanently satisfactory series of adjustments might be made under the present zoning. These adjustments, in addition to regulation by bulk ratio, might include: reclassification of large sections on the Use map for residential development; improvement of Height and Area standards so as to afford better protection for owners of existing buildings; establishment of a light manufacturing and perhaps a neighborhood business district; and relaxation of restrictions on parking garages. ⁽⁵⁰⁾

However, for the reasons cited above, and additional evidence gathered in the course of the staff's studies, a completely fresh start under a new modern law is believed preferable to interim revisions.

Psychologically as well as practically the more positive form of law, in which sections of the city are assigned to the districts in which the uses appropriate to them are fully defined, is preferable to the present negative form, in which the type of building that may be erected is arrived at only after a consideration of all the types that are forbidden.

STUDIES FOR A NEW ZONING ORDINANCE

On the supposition that advanced zoning techniques have more to offer than a recasting of the existing law, the staff made extensive investigations which resulted in specific recommendations. In these studies the staff was guided by the following

principles and objectives. It seemed that a new and modern zoning ordinance for New York City should among other things:

1. Assign to each property uses and types of buildings that are appropriate to that property and consistent with a comprehensive pattern for the immediate neighborhood and the city as a whole;

2. Protect entire neighborhoods, as well as individual plots from inconsistent utilization of adjacent land. Large apartments should not be permitted next door to the smaller homes of the private owner;

3. Aid in the creation of neighborhood "character"—that hard-to-define quality that makes the difference between a pleasant community and just another place to live;

4. Provide reasonable opportunity for all well-situated private land to be able eventually to produce income. To achieve this end, it is essential to protect property owners against over-intensive use of land. As there is more land area than the present or future population of the city can ever use for private building, it follows that the less intensively we use the land, the more of it we shall be able to put to use. There is thus a real need for zoning that bears a rational relationship to the prospective population and needs of the city;

5. Guide not only the *geography* of the city's growth (now done somewhat ineffectively by the Use map), but of the *form* of its growth as well. This is a case for protective regulation. Outside the principal business districts, the present zoning permits vastly more bulk and height than can generally be built. Suitable restrictions would not only assure light and air on adjoining lots, but also would prevent the excessive concentrations of people that overtax the capacity of sidewalks, streets and transit facilities;

6. Provide an "inclusive type" of zoning districts, each Use district carrying its own complete set of height, area, court, bulk and density provisions;

7. Provide a "direct type" of zoning, specifically stating the uses permitted in each district, rather than allowing any use not appearing on a prohibited list;

8. Adequately protect residential sections against the intrusion of business and industrial uses;

(50) For action on these latter points see the "Report and Resolution of the City Planning Commission Amending the Building Zone Resolution of the City of New York" adopted May 29, 1940.

9. Create business and shopping districts specially designed as accessory to residential neighborhoods; and

10. A modern ordinance should also achieve careful differentiation and segregation of the different types of residential uses.

Acting on the foregoing principles the staff conducted a series of detailed zoning studies. These studies resulted in an outline for an ordinance which contained a schedule of districts desirable in the city and applicable to conditions in New York. The staff of the Mayor's Committee, having completed studies of existing land use as related to the established zoning, was able to prepare only a skeleton framework of a modern zoning ordinance for New York. In no sense is this outline to be viewed as a finished product. It was purposely left incomplete, that it might better serve as a basis for discussion of fundamentals.

These zoning studies were closely correlated with the Residential Area conclusions, which are described in a separate chapter of this report. Thus, the outline for a new zoning ordinance was conceived as one of the means of moulding the future city into the land use pattern envisaged in the Residential study. It also provides for the various types of residential, business and industrial developments that had become evident in general form as a result of the city-wide studies of the staff. Each broad type of development was given appropriate Use, Height, Area and Bulk provisions, so that every proposed zoning district will be of the all-inclusive type, requiring only one map in accordance with modern practice. A sufficient number of districts were included to provide for normal gradations of land use, both residential and non-residential. Particular care was taken to suggest an adequate number of business districts.

The proposed Height provisions recognize that sheer walls cut off sun, light and air. The maximum height, before setbacks would be required, is fixed at one times the street width. Setbacks would be permitted in all districts where they are appropriate. Towers would not only be permitted, but would be encouraged by the operation of the bulk ratio principle.

The proposed Area and Coverage provisions are more restrictive than in the present Zoning Resolution, thus conforming to the generally accepted trend of current practice and design. In most cases there should be usable open space within the boundaries of the lot, which may be used for courts, gardens and playgrounds; or, in the case of commercial structures, for loading and parking

of vehicles. The suggested standards would help to prevent unnecessary and uneconomic crowding of the land.

The proposed ordinance would, through the application of floor area ratios, directly regulate building bulk as such rather than indirectly as is done at present by combinations of height and coverage clauses. The floor area ratio provisions are along the lines suggested by the Joint Zoning Committee of the Mayor's Committee on City Planning and the City Club of New York. These provisions are an actual outgrowth of this Committee's suggested bulk regulations, and a comprehensive series of tests which applied the original standards to a wide range of building types on lots of various sizes, and abutting streets of different widths. These investigations, conducted by architects attached to the staff, led to the introduction of graduated provisions which would permit greater bulk on wide than on narrow streets, and greater bulk on corner than on interior lots. By means of the floor area ratio the principle established in the present Zoning Ordinance for height regulation would be extended to include bulk. In all cases the bulk permitted by the proposed ordinance is based upon the ratio of the gross floor area, in square feet, to the gross area of the lot in square feet. This basis was believed preferable to a ratio in terms of cubic feet of building volume, which might tend to encourage undesirably low ceilings in new structures.

A sliding scale of floor area ratios for each type of zoning district would give a wider range of choice than is now available to the builder and lot owner. Within reasonable limitations, one could erect a low squat building or a tall narrow building of the same bulk, under the flexible provisions of the proposed zoning.

Regulations for courts and yards are not included in the outline. It is believed that regulations should be as simple as possible, stipulating irreducible minimum dimensions. In most cases these minimum measurements would be considerably increased by operation of the proposed coverage and bulk limitations.

Summary Of Suggested Zoning Districts

The principal characteristics of the several zoning districts included in the proposed new ordinance are outlined below. Each district would permit all of the uses allowed in more restrictive districts, except that residential construction in the Industrial District would be discouraged. For a

more detailed description of the ordinance here outlined, the reader should consult Tables I and II, and the Zoning Appendix.

Residence Districts

The nine residence districts included in the proposed ordinance seem adequate to serve the city's needs for the major types of development.

The R-1 District is designed to preserve the character of better single-family neighborhoods where large lots are the rule. Lots would be at least 8,000 square feet with a minimum width of 80 feet. This width would be equivalent to four 20-foot lots in Queens; but in other boroughs where property is normally in multiples of 25 feet, the probabilities are that a frontage of 100 feet would generally result. Coverage would be limited to 25 percent and bulk to 0.65 square feet of floor per square foot of lot. As this is the most restricted district, a great deal of the unripe and impractical residential areas would be placed in this classification on the zoning map, until such time as they can be advantageously developed.

The R-2 District is intended for those single-family neighborhoods where lots are relatively smaller than in R-1 Districts. It would include sections where existing development is on lots of 5,000 square feet or more. It would also apply to undeveloped sections where there are indications that houses in the \$8,000 to \$15,000 price range will be most suitable. In the R-2 District, a lot size of 5,000 square feet is recommended, with permitted coverage of 35 percent and a floor area ratio of 0.8 square feet of floor per square foot of lot. Yard dimensions are ample, but not as large as in the R-1 District.

The R-3 District applies to large sections where single and two-family houses and one-family row houses are now intermixed; sections developed exclusively with one-family row houses or two-family houses of either double-decker or semi-detached type; and sections that seem best suited for the latter types of construction. It is the only district in the proposed ordinance that would permit one-family row houses and two-family houses and at the same time exclude apartments. Two and three-family row houses would not be permitted.

A pair of semi-detached houses would require a 5,000 square foot lot with 50 feet of frontage; but a free-standing single-family house would have to have 3,750 square feet and 37.5 feet of frontage. A two-story double house could be built on a 5,000 square foot lot. Single-family row houses

would require 2,000 square feet of land each, with at least 20 feet of frontage, and a minimum side yard of seven feet at one end of the row. In order to protect the neighborhood against excessively long rows of houses, it is suggested that the minimum sum of the side yards at the two ends of the row be seven times the number of units in the row.

Coverage would be limited to 35 percent for free-standing single houses and two-family houses; and to 25 percent for row houses. Bulk regulations, in terms of square feet of floor space per square foot of lot, would be as follows: Free-standing single house 1.0; Two-family house 1.0 and Row Houses 0.6 (entire row as a unit). The lower floor area ratio for row houses is based on the consideration that they cannot be more than two rooms deep without having a windowless room.

The R-4 District is designed for "garden" type apartments, both of high and of medium rent. The Residential Area study convinced the staff that there are substantial outlying sections of the city where apartment house developments should be permitted, but where land values and other conditions do not justify the high coverage and bulk that characterize "city-type" apartments. In addition to these as yet undeveloped sections, the R-4 District would apply to partially built neighborhoods of small apartment houses and three-family dwellings. Some of the sections designated in the Residential Area study for "Demolition and Low-Rent Housing" could be placed in this zone, so as to limit coverage when rebuilt, and prevent the creation of potential future slums.

In the R-4 District, coverage would be limited to 35 percent for interior lots, and 45 percent for corner lots. The floor area ratio for this and the other less restrictive districts would be determined by formulas in which the street widths are variables. For an interior lot on a 60-foot street, a ratio of 1.5 square feet of floor per square foot of lot would be permitted in an R-4 District, increasing to 2.5 square feet on a 100-foot street. For corner lots, the formula takes into account the widths of both streets in order that a building fronting on two 100-foot streets may be permitted more bulk than one at the corner of a 100-foot and a 60-foot street. The latter floor area ratio would be 2.6 and the former 3.0 square feet per square foot of lot.

In the R-4 District, building height would be restricted to one times the street width, with no towers or setbacks permitted. A front yard of 10 feet would be required.

The R-5 District would apply to built-up multi-family areas not suited for the "garden" type apartment; and also to unbuilt or partially-built sections where land values and other factors make the "city type" apartment building the only logical development. Many of the existing residential areas believed suitable for this district are now zoned for "Business" or, even worse, are in the "Unrestricted" zone. The R-5 District would fit the needs of the vast apartment house sections of The Bronx, Upper Manhattan and Brooklyn, and might also include some of the old tenement neighborhoods where there is not sufficient non-residential use of property to justify a business district. The R-4 District, previously described, could take care of slum clearance sections where low rent "garden" type apartments would be more appropriate than the R-5 type of development.

Buildings in the R-5 Zone could cover 45 percent of interior lots and 55 percent of corner lots. Bulk would vary from 2 square feet of floor per square foot of lot for interior parcels on 60-foot streets, up to 4 square feet per square foot at the corner of two 100-foot streets. Building height would be restricted to one times the width of the street and no setbacks or towers would be permitted. No front yards would be required.

The R-6 District is designed for large apartments, in locations where land costs and other conditions are not conducive to more spacious development. It would provide the up-to-date equivalent of the obsolete type of Park Avenue apartment house. This district would be somewhat limited in its areas of application but nevertheless fills a manifest need in New York.

A coverage of 55 percent would be permitted on interior lots, and 65 percent on corner lots. Under the existing Zoning Resolution and Multiple Dwellings Law, coverages in the "C Area District" are approximately 70 percent and 80 percent respectively, for apartment buildings. Staff studies indicate that these excessive coverages produce obsolete housing, and that it is entirely reasonable to stipulate lower percentages, in order to obtain more light and air, better living conditions, and stable neighborhoods.

Building height is limited to one times the street width, but greater heights would be permitted if the building envelope remained within the lines of setbacks of 10 feet horizontally for each 30 feet of additional height. Towers equivalent to 20 percent of the lot area could be built, if set back 25 feet from front and rear lot lines, and 10 feet from side lot lines.

The floor area ratio formula for interior lots in the R-6 District is 3 square feet of floor per square foot of lot on 60-foot streets, and 4 square feet on 100-foot streets. For corner lots, 5.6 square feet per square foot of lot would be permitted at the intersection of a 60-foot and a 100-foot street, and 6 square feet when both streets are 100 feet wide.

R-4A, R-5A and R-6A Districts would have the same regulations as the R-4, R-5 and R-6 Districts respectively, with the additional provision that retail stores would be permitted on the ground floor of residential buildings. Those stores would be limited to the types needed for local shopping. The districts have purposely been classified as "residential", rather than "business" or "retail business", as the stores are to be viewed, in this instance, as strictly accessory to the residential use of the upper floors and the nearby properties. These three accessory districts will take care of local needs, without depreciating the value and attraction of residential neighborhoods by the intrusion of moving picture theaters, gasoline stations, repair shops and other business uses. One of these districts at a strategic street intersection will often be sufficient to serve a new apartment house neighborhood.

Business Districts

The outline ordinance suggests five different business districts which are described below.

The B-1 District is designed to meet the need for a neighborhood business district that would permit only those types of retail use that logically serve outlying districts of one and two-family houses. Real estate offices, doctor's offices and the like would also be allowed. Apartments and buildings of any kind exceeding two stories would be excluded. Coverage would be limited to 60 percent of interior lots and 70 percent of corner lots. Front and rear yards would be required, but not side yards. Bulk up to 1.5 square feet of floor per square foot of lot would be permitted for interior parcels and 1.7 square feet per square foot for corner lots, irrespective of street width. Filling stations, garages, and theaters would be excluded from this zone. Frequently, B-1 Districts could be limited to the four corners of intersecting streets where stores are needed.

The B-2 District, intended for New York's central retail section, is a close counterpart of the present "Restricted Retail District" and its use provisions would be similar. Theater and motor vehicle sales lots would not be allowed. Garages

for more than five cars, service stations and repair shops, gasoline filling stations and wholesale storage, would also be excluded.

B-2 Districts could be introduced in many locations now zoned for "Business" because actual utilization of the land fronting on many miles of street is now confined to retail use. The B-2 District, though the same in intent as the present "Restricted Retail" zone would, therefore, be many times as large in area and could become a general type rather than a special type of district.

As in all the more intensive zones, sheer height would be limited to one times street width, with three-on-one setbacks permitted, and also towers on 20 percent of the lot area. Coverage of 80 percent would be allowed on interior lots and 90 percent on corner lots.

The floor area ratio formulas would be the same for the B-2 District as for B-3 (Central Business) and B-5 (Commercial) Districts. For interior lots, the ratio would be 6 square feet of floor per square foot of lot on 60-foot streets, and 7 square feet per square foot on 100-foot streets. The corner of a 100-foot and a 60-foot street could be built up to a ratio of 11.6 square feet and at the intersection of two 100-foot streets a maximum of 12 square feet per square foot of lot would be permitted.

The B-3 District corresponds with the present "Retail District" and is thus the most restrictive district to permit theaters, moving picture houses and motor vehicle sales lots. It is intended to embrace the central business sections of the city. All provisions, other than use, are identical with those described for B-2 Districts.

The B-4 District would provide for outlying business sub-centers, where there is no need for the extreme bulk permitted in the Manhattan and Brooklyn downtown office and shopping centers. The diversity of uses is, however, substantially the same. The B-4 Zone would therefore permit office buildings; a somewhat more limited amount of manufacturing than the present "Business" districts and also filling stations, wholesale storage and other customary business uses. It would be the most restrictive zone permitting garages and open parking lots for more than five vehicles. Such uses would be prohibited in neighborhood and central retail business districts, except on special approval of the Board of Standards and Appeals.

A sheer height equal to one times the street width would be allowed plus three-on-one setbacks, and tower on 20 percent of the lot. Coverage

would be limited to 70 percent of interior lots and 80 percent of corner lots. The permitted floor area ratio, determined by separate formulas for interior and corner lots, would vary from 4.5 square feet of floor per square foot of lot for an interior lot on a 60-foot street, to 9 square feet at the intersection of two 100-foot streets.

The B-5 District is designed for central wholesale business, office buildings, and a somewhat smaller amount of light manufacturing than is permitted in the present "Business" zones. It would correspond to those parts of the existing "Business" districts that cannot more logically be changed to a more restrictive business zone or to a residential zone.

Height and bulk provisions would be the same as described for B-2 Zones. Coverage of 80 percent on interior lots and 90 percent on corner lots would be permitted.

Industry

The Industrial District is intended for all types of industry not permitted in the present "Business" zone, and therefore not to be permitted in the B-5 Zone. It would correspond closely to the present "Unrestricted" zone, but would exclude a carefully selected list of nuisance industries, except on special approval of the Board of Standards and Appeals.

The proposed Industrial District would not include those large areas of unripe land and land under water that are now zoned "Unrestricted" or "Undetermined". Improvement of unsuitable lands should be discouraged, at least until an actual need for their development is demonstrated. Such areas could be put in a highly restrictive district, such as an open type residential zone. In this way, the expense of providing city services, sewers and transportation may be avoided until there is actual justification for such outlays.

Residential buildings are not suitable in heavy industrial areas. The smoke, dust and odors of manufacturing industry are prejudicial to health. New buildings for residential use would be excluded from Industrial Districts, except on special approval of the Board of Standards and Appeals. This is believed to be a valid exception to the general rule of zoning that every district shall permit all uses allowed in the more restrictive districts.

Coverage of 80 percent of interior lots and 90 percent of corner lots would be allowable, the same as for B-5 Zones. Bulk and off-street loading provisions would conform to those described for B-4 Districts.

Applications of Proposed Zoning

Following the formulation of the zoning district proposals in specific terms, the staff applied them experimentally to sections presenting a wide variety of conditions throughout the city. The actual rezoning of New York along these or any lines would require a great deal of detailed study and obviously must be left to the official City Planning Commission. Moreover, it should not be attempted without the fullest and most recent information, including an up-to-date land use map of the entire city. ⁽⁵¹⁾ Nevertheless, the trial applications to date have borne out the practicability and desirability of a zoning ordinance containing the districts outlined above.

The Zoning Appendix gives the outline of the Proposed Building Zone Resolution, a summary table of the suggested provisions by districts and a table of suggested floor area ratios for each district. A series of diagrams showing the effect of the regulations upon the bulk and form of buildings is included in the text.

CONCLUSION

The real zoning issue may be summarized as follows. Until recently the psychology in New York, reflected in the actions and decisions of

private citizens and public bodies alike, has been that of a rapidly growing city of very limited land area. The present zoning law conforms to this idea and is in a large degree responsible for the progressive over-development, blighting and abandonment of large sections of residential and non-residential uses.

The facts now apparent point to precisely the opposite conclusion. New York's ultimate growth will be so limited as to be almost unnoticeable if spread throughout the city as a whole. ⁽⁵²⁾ Zoning can be instrumental in bringing about desirable forms of development—residential areas of all types where people will actually desire to live rather than to escape at the earliest opportunity, and business and industrial areas where activity will thrive rather than be smothered by congestion.

These zoning studies are presented as the contribution of the Mayor's Committee on City Planning staff to the solution of the zoning problem. It is believed that they furnish a sound working basis for more extended analysis of the problem and the formulation of a new zoning law by the City Planning Commission. It is no exaggeration to state that of all the subjects that have been studied by the Planning Committee, there is none so vital to the orderly development of the city as zoning.

⁽⁵¹⁾ In 1938 the City Planning Commission sponsored a WPA project which completed a detailed survey of land uses throughout the city.

⁽⁵²⁾ The Federal Census reports that the population of New York City increased nearly 18 percent during the decade 1910-1920 and 23 percent for the period 1920-1930 but the tentative figure for 1940 shows an increase of less than 7 percent since 1930.

N.Y.C. PROPOSED BUILDING ZONE RESOLUTION -1937

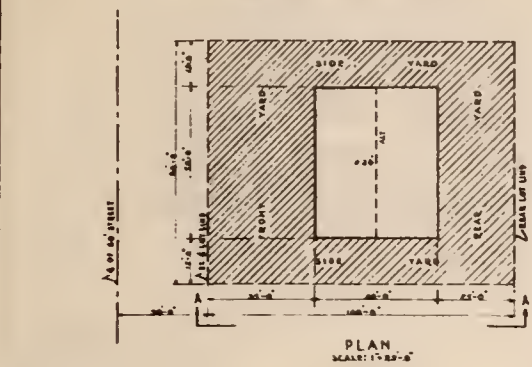
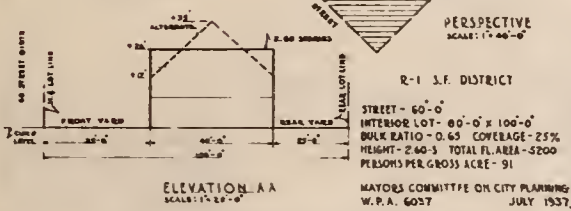


Fig. 73



N. Y. C. PROPOSED BUILDING ZONE RESOLUTION 1937

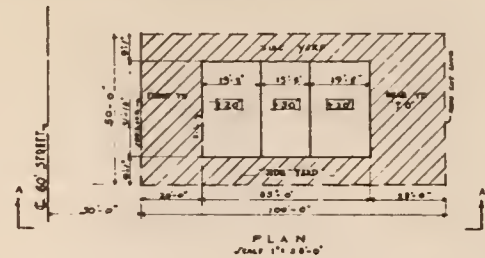
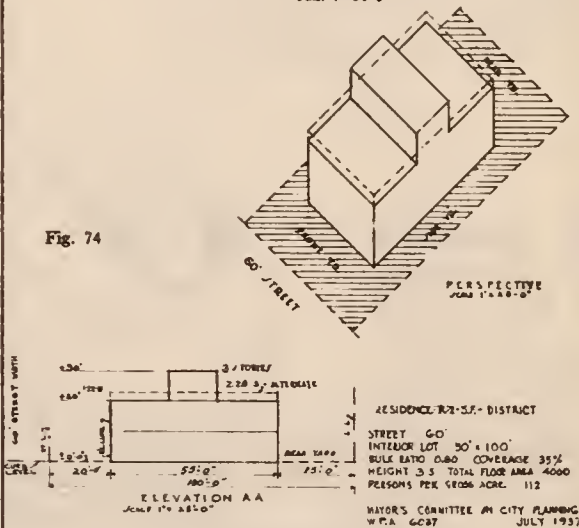


Fig. 74



N.Y.C. PROPOSED BUILDING ZONE RESOLUTION -1937

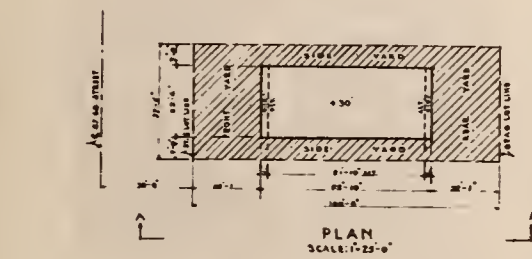
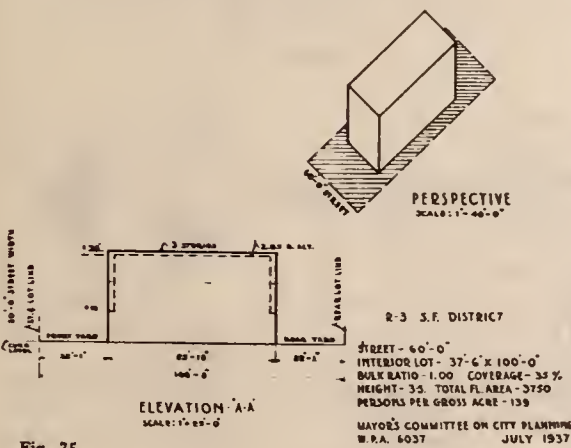


Fig. 75



N.Y.C. PROPOSED BUILDING ZONE RESOLUTION 1937

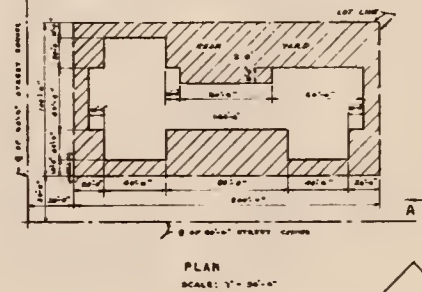
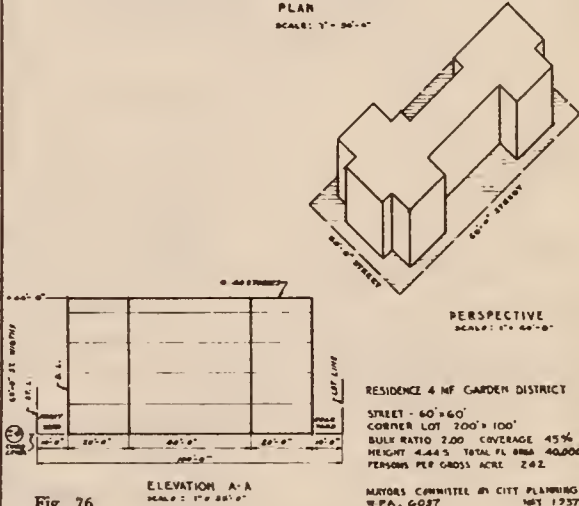


Fig. 76



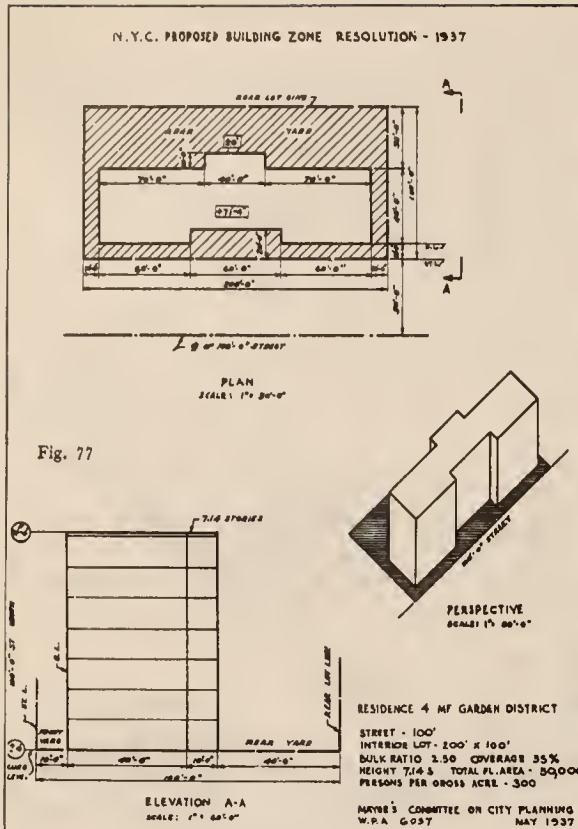


Fig. 77

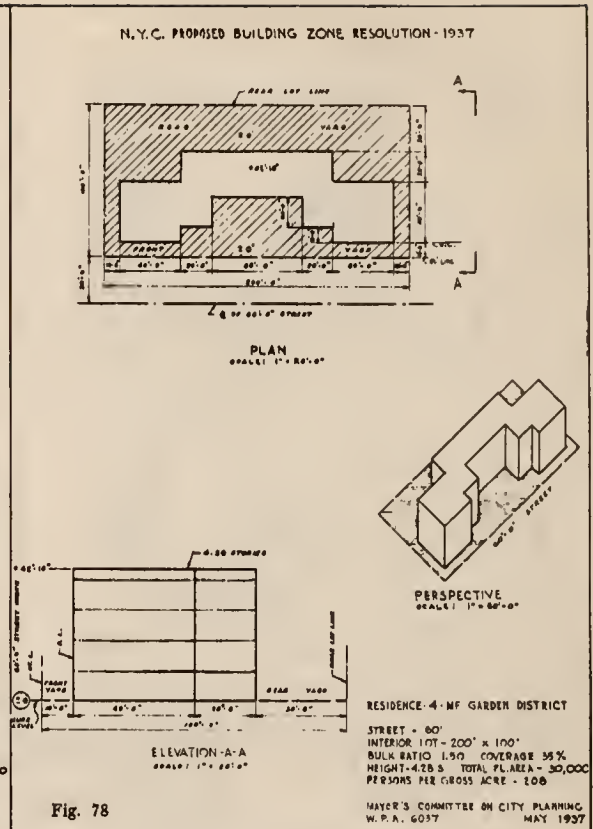


Fig. 78

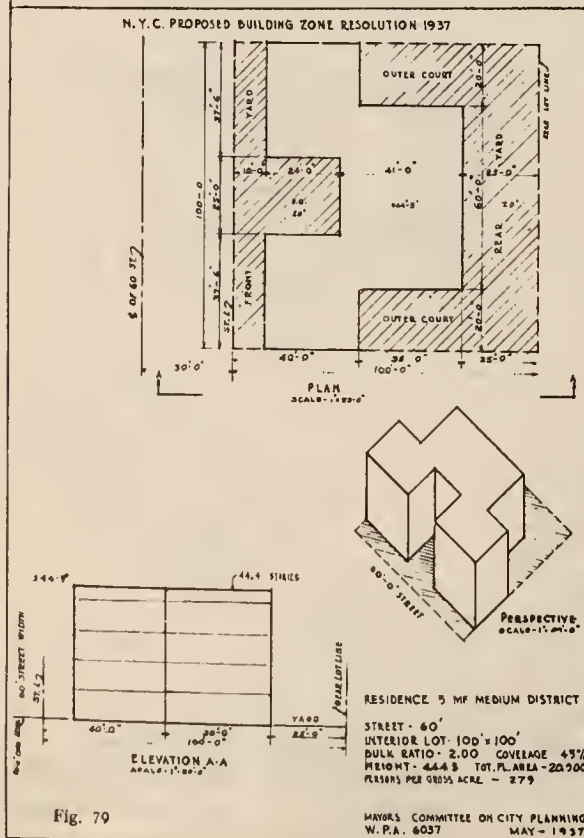


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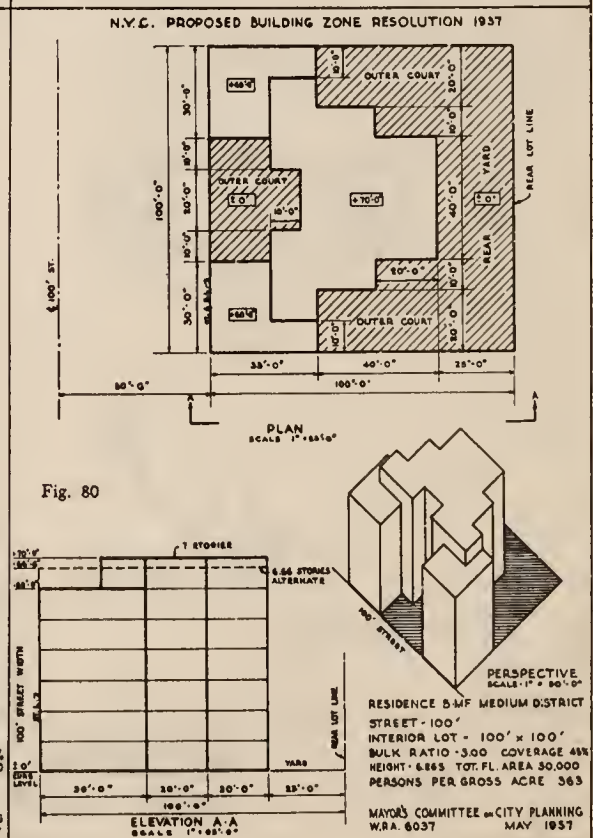
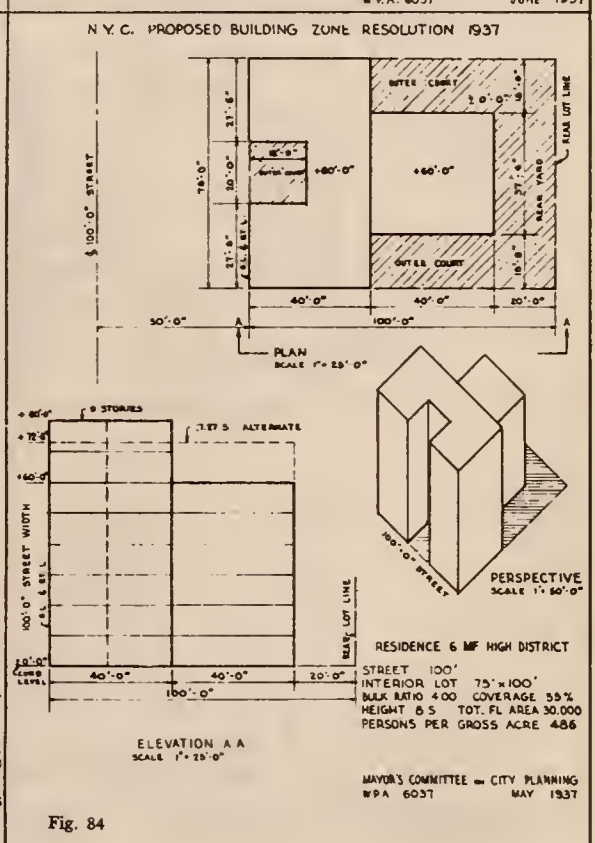
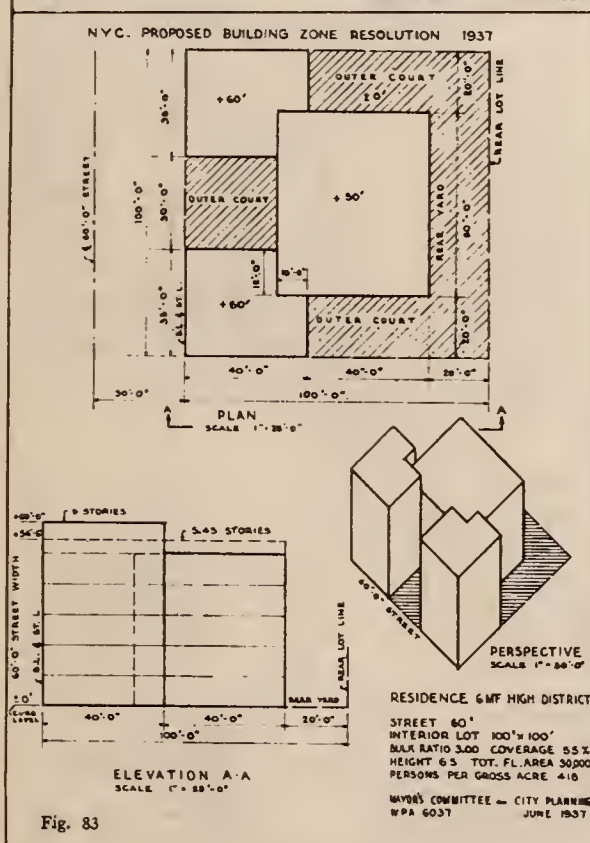
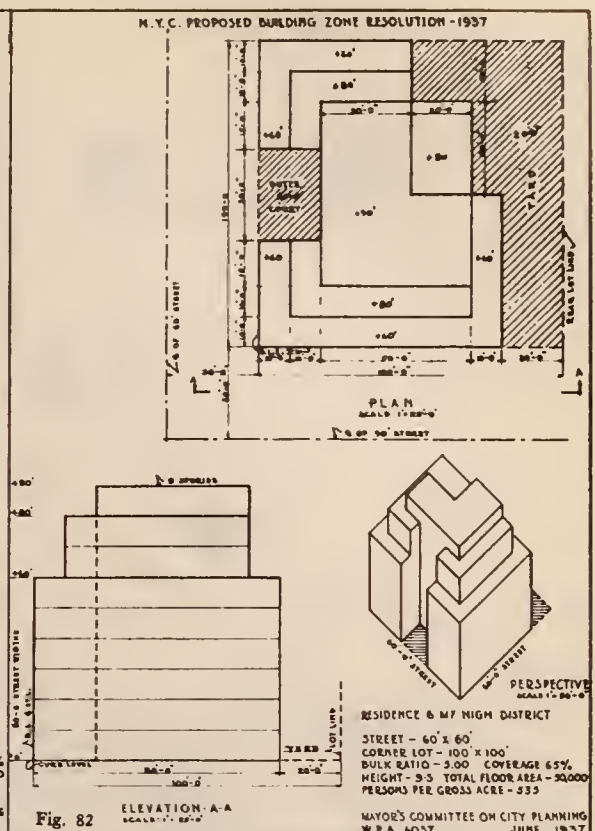
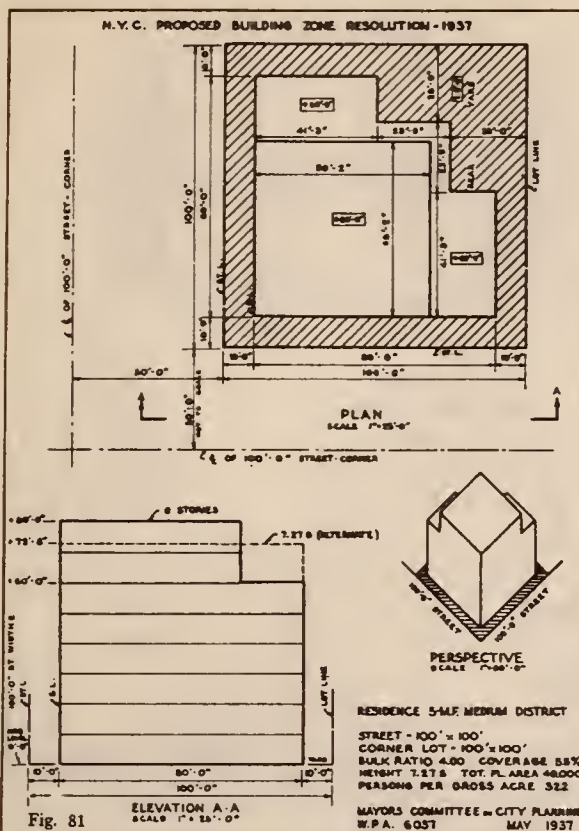


Fig. 80



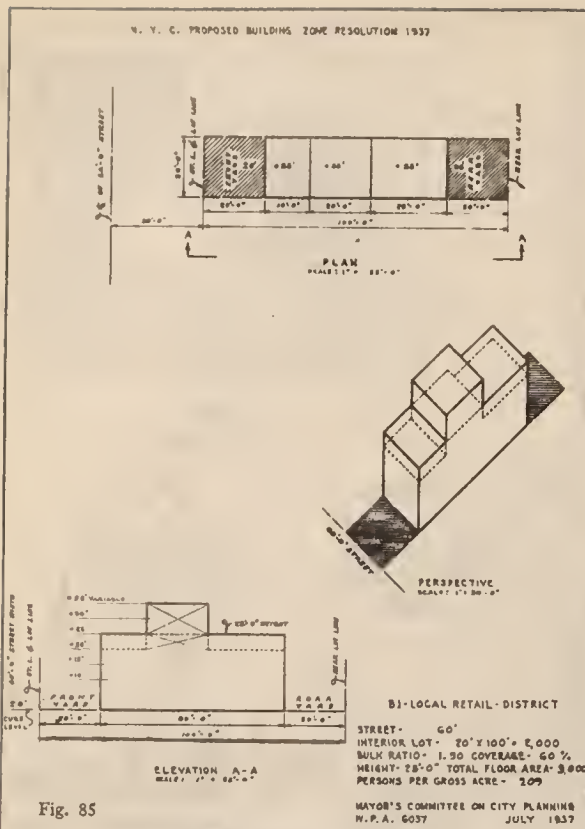


Fig. 85

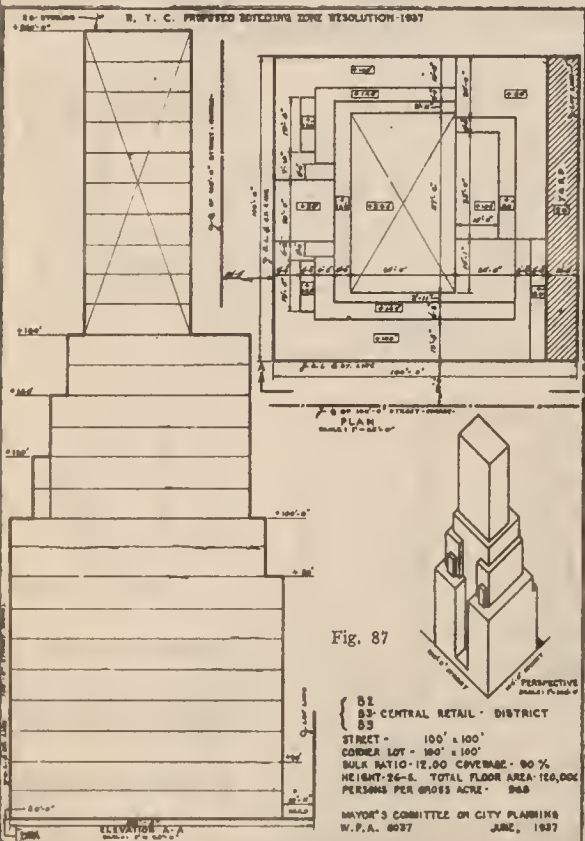


Fig. 87

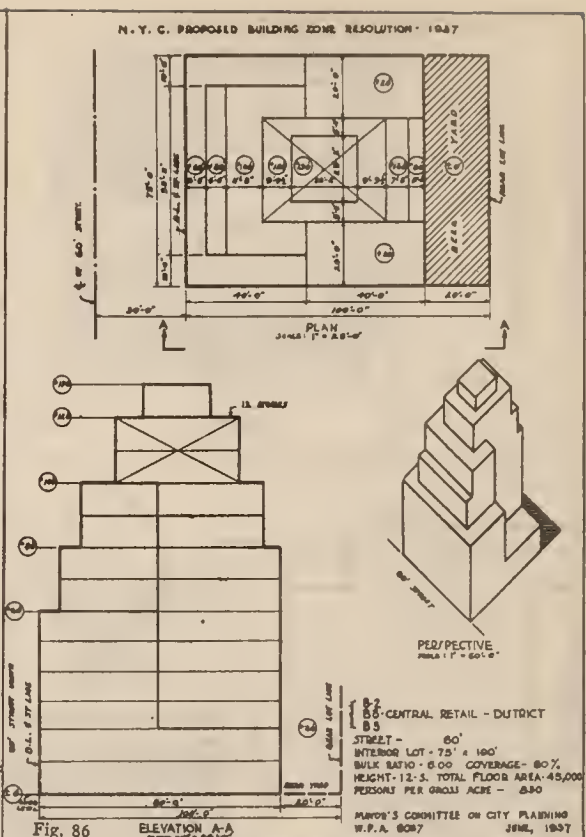


Fig. 86

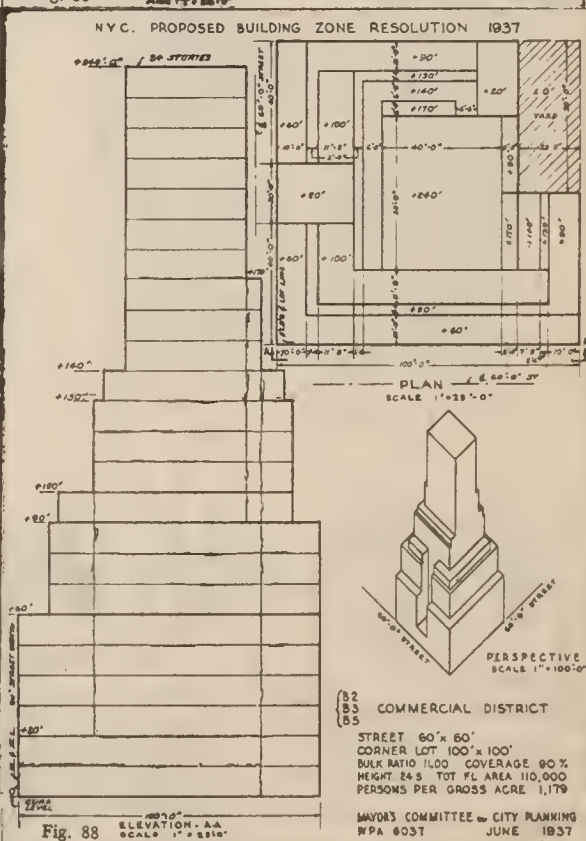


Fig. 88

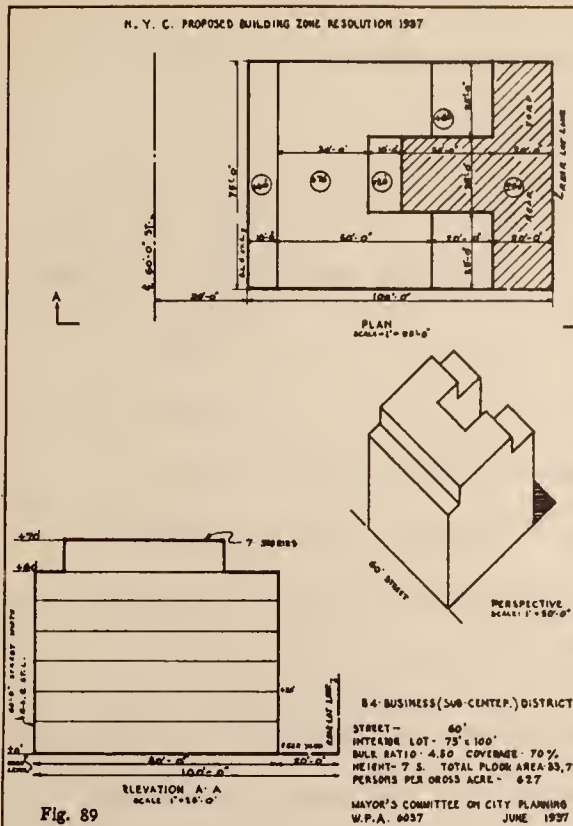


Fig. 89

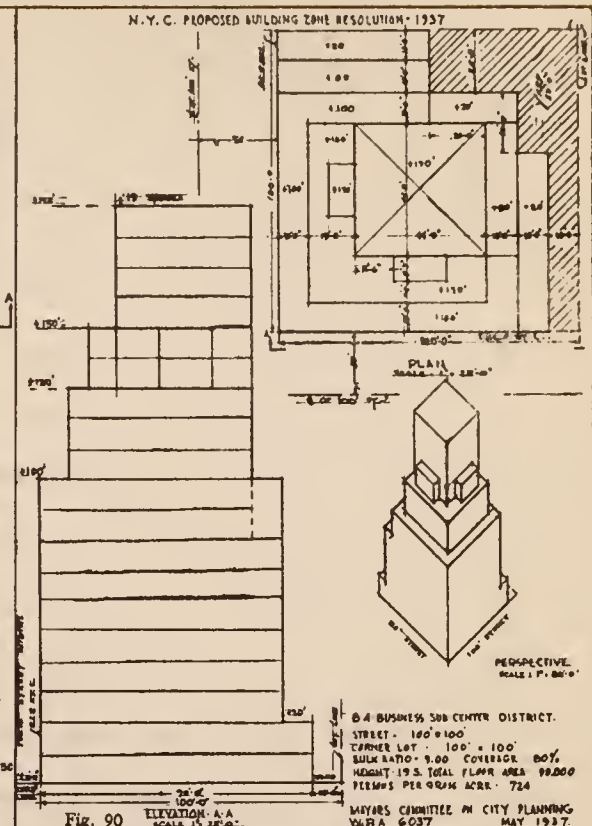


Fig. 90

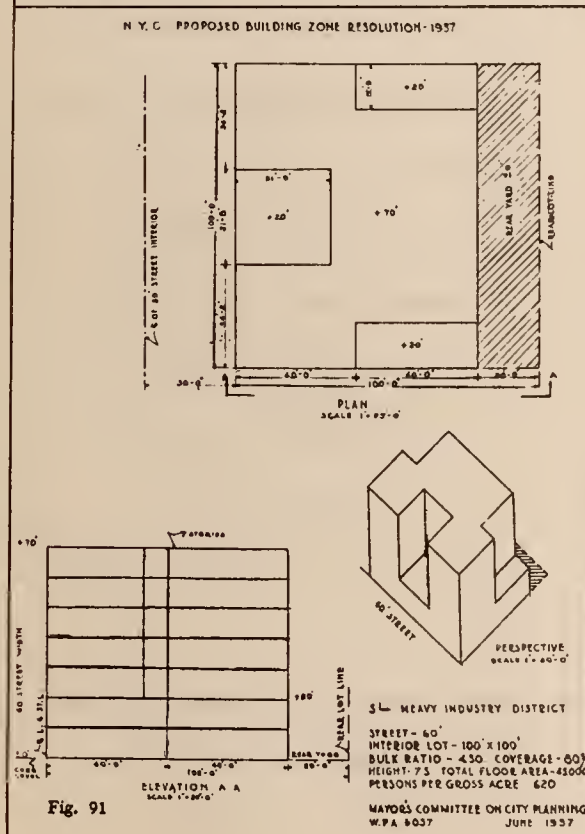


Fig. 91

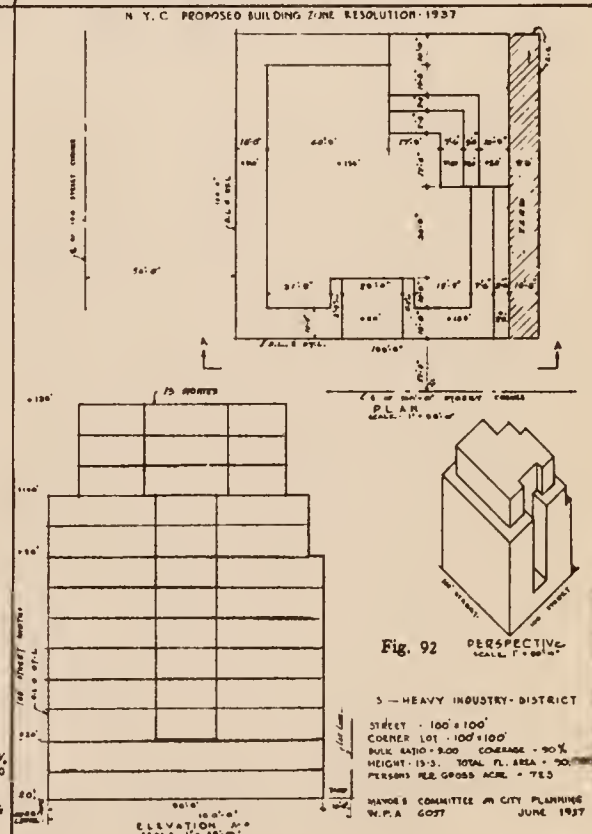


Fig. 92

Zoning Appendix

OUTLINE OF PROPOSED BUILDING ZONE RESOLUTION—MAY 17, 1937

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OUTLINE OF PROPOSED BUILDING ZONE RESOLUTION—MAY 17, 1937

ARTICLE I—DEFINITIONS

Certain words in this resolution are defined for the purposes thereof as follows:

(a) Words used in the present tense include the future; the singular number includes the plural and the plural the singular; the word "lot" includes the word "plot"; the word "building" includes the word "structure".

(b) The "street line" is the dividing line between the street and the lot.

(c) The "width of the street" is the mean of the distances between the sides thereof within a block. Where a street borders a public place, public park or navigable body of water the width of the street is the mean width of such street plus the width, measured at right angles to the street line, of such public place, public park or body of water.

(d) The "curb level" for the purpose of measuring the height of any portion of a building, is the mean level of the curb in front of such portion of the building. But where a building is on a corner lot the curb level is the mean level of the curb on the street of greatest width. If such greatest width occurs on more than one street, the curb level is the mean level of the curb on that street of greatest width which has the highest curb elevation. The "curb level" for the purpose of regulating and determining the area of yards, courts and open spaces is the mean level of the curb at that front of the building where there is the highest curb elevation. Where no curb elevation has been established or the building does not adjoin the street, the average ground level of the lot shall be considered the curb level.

(e) A "street wall" of a building, at any level, is the wall or part of the building nearest to the street line.

(f) The "height of a building" is the vertical distance measured in the case of flat roofs from the curb level to the level of the highest point of the roof beams adjacent to the street wall, and in the case of pitched roofs from the curb level to the mean height level of the gable. Where no roof beams exist or where there are structures wholly or partly above the roof, the height shall be measured from the curb level to the level of the highest point of the building. Where a building is a tenement house, as defined in the Tenement House Law, the height of the building on the street line shall be measured as prescribed in said law for the measurement of the height of a tenement house; and such measurement shall be from the curb level as that term is used in said law.

(g) The "depth of a lot" is the mean distance from the street line of the lot to its rear line measured in the general direction of the side lines of the lot.

(h) A "rear yard" is an open unoccupied space on the same lot with a building between the rear line of the building and the rear line of the lot.

(i) The "depth of a rear yard" is the mean distance between the rear line of the building and the rear line of the lot.

(j) Lots or portions of lots shall be deemed "back to back" when they are on opposite sides of the same part of a rear line common to both and the opposite street lines in which the lots front are parallel with each other or make an angle with each other of not over 45 degrees.

(k) A "court" is an open unoccupied space other than a rear yard, on the same lot with a building. A court not extending to the street or to a rear yard is an "inner court". A court extending to the street or a rear yard is an "outer court". A court on the lot line extending through from the street to a rear yard or another street is a "side yard".

(l) The "height of a yard or a court" at any given level shall be measured from the lowest level of such yard or court as actually constructed or from the curb level, if higher, to such level. The highest level of any given wall bounding a court or yard shall be deemed to be the mean height of such wall. Where a building is a tenement house, as defined in the Tenement House Law, the height of a yard or a court shall be measured as prescribed in such law.

(m) The "least dimension" of a yard or court at any level is the least of the horizontal dimensions of such yard or court at such level. If two opposite sides of a yard or court are not parallel the horizontal dimension between them shall be deemed to be the mean distance between them.

(n) The "length of an outer court" at any given point shall be measured in the general direction of the side lines of such court from the end opposite the end opening on a street or a rear yard to such point.

(o) The "area of a building" is the number of square feet of horizontal surface covered by the building at the curb level, all measurements being made between exterior faces of

walls, including the foundation walls of roofed porches. The "area of a building" shall include the area of accessory buildings on the same lot.

(p) The "percentage of coverage of a building" is one hundred times the quotient of the "area of a building" divided by the area of the lot on which it stands.

(q) The "floor area of a building" is the total gross number of square feet of horizontal floor surface in the building excluding cellars and basements, all horizontal measurements being made between exterior faces of walls, including the foundation walls of roofed porches. The floor area of a building shall include the floor area of accessory buildings on the same lot.

(r) The "floor area ratio" of a building is the quotient of the "floor area of a building" divided by the area of the lot on which it stands.

ARTICLE II—RESIDENCE DISTRICTS

R-1 DISTRICT

Use (1) Single-family detached dwellings and their accessory buildings.

(2) Clubs, excepting clubs whose chief activity is a service customarily carried on as a business.

(3) Churches.

(4) Schools, libraries, public museums, court houses, fire houses, police stations and local electrically operated pumping stations for supply of water for domestic uses, or fire protection.

(5) Philanthropic or eleemosynary uses or institutions, other than correctional institutions.

(6) Hospitals and sanitariums other than for the insane or feeble-minded, or for contagious or infectious diseases, or for liquor or drug addicts.

(7) Railroad passenger stations.

(8) Farming, truck gardening, nurseries or green houses.

In a residence district, no building or premises shall be used for any other than a use above specified for which buildings may be erected and for the accessory uses customarily incident thereto. The term "accessory use" shall not include a business nor shall it include any building or use not located in the same lot with the building or use to which it is accessory. A private garage for more than three motor vehicles shall not be deemed an accessory use. Space in a private garage for one motor vehicle of other than a commercial type may be rented.

Height—35 ft. or 3 stories, whichever is the most restrictive.

Area of Lot—8000 sq. ft. minimum.

Width of Lot—80 ft. minimum.

Percentage of Coverage—25 percent.

Yards

Front—25 ft. or 25% of depth of lot, whichever is the least restrictive.

Side—15+15 or 37.5% of the width of lot, whichever is the greater.

Rear—25 ft. or 25% of depth of lot, whichever is the least restrictive.

Floor Area Ratio—0.65 sq. ft. per sq. ft. of lot.

R-2 DISTRICT

Use—Same as for R-1 District.

Height—35 feet or 3 stories, whichever is the most restrictive.

Area of Lot—5,000 sq. ft. minimum.

Width of Lot—50 ft. minimum.

Percentage of Coverage—35 percent.

Yards

Front—20 ft. or 20 percent of depth of lot, whichever is the least restrictive.

Side—Minimum 9 feet, minimum sum, 18 feet or 36 percent of the width of lot, whichever is the greater.

Rear—25 ft. or 25 percent of depth of lot, whichever is the least restrictive.

Floor Area Ratio—0.8 sq. ft. per sq. ft. of lot.

R-3 DISTRICT—(Single, Two-Family and Row Houses)

Use—Same as for R-1 District.

Single-Family semi-detached dwelling. Single-Family Row House.
Two-Family dwelling (double-decker)—Boarding House.

Height—35 feet or 3 stories, whichever is the most restrictive.

Area of Lot—5,000 sq. ft. minimum for two single-family semi-detached dwellings.
3,750 sq. ft. minimum for single-family detached dwellings.
5,000 sq. ft. minimum for two-family dwellings (double-decker).
2,000 sq. ft. minimum for row houses.

Width of Lot—50 ft. minimum for two single-family semi-detached dwellings.
37.5 ft. minimum for single-family detached dwellings.
50.0 ft. minimum for two-family dwellings (double-decker).
20 ft. minimum for single-family row houses.

Percentage of Coverage—35 percent for two single-family semi-detached dwellings.
35 percent for single-family detached dwellings.
35 percent for two-family dwellings (double-decker).
25 percent for a group of single-family row houses.

Yards

Front—15 ft. or 15% of depth of lot, whichever is the least restrictive.

Side—Minimum 7 feet; minimum sum 14 ft. or 37% width of 3,750 sq. ft. lot and 28% width of 5,000 sq. ft. lot, except for row houses. For row houses, minimum 7 feet at end of row; and minimum sum (in feet) of side yard at the two ends of row to be seven times the number of houses in the row.

Rear—20 ft. or 20% of depth of lot, whichever is the least restricted.

Floor Area Ratio—1.0 sq. ft. per sq. ft. of lot, for two single-family semi-detached dwellings.
1.0 sq. ft. per sq. ft. for single-family detached dwellings.
1.0 sq. ft. per sq. ft. for two-family dwellings (double-decker).
0.6 sq. ft. per sq. ft. for a group of single-family row houses.

R-4 DISTRICT—(Garden Apartments)

Use—(1) Same as for R-3 District.

(2) Two-family row house.

(3) Multi-family dwelling, or Apartment House.

Height—One times width of street (in case of corner lots, one times width of wider street for a horizontal distance not to exceed 100 feet from corner).
For purposes of computation, no street shall be taken as wider than 100 feet.
No setbacks or towers.

Area of Lot—No restrictions.

Width of Lot—20 ft. minimum.

Percentage of Coverage—Interior Lots 35 percent.
Corner Lots 45 percent.

Yards

Front—10 ft. minimum or 10% depth of lot.

Side—10 ft. minimum, minimum sum 20 ft. or 20% depth of lot.

Rear—30 ft. or one-half the sheer height above the rear yard, whichever is the greater.

Courts—To be a function of sheer height with minimum dimensions.

Floor Area Ratio

Interior Lots—sq. ft. per sq. ft. of lot = $\frac{W}{40}$

where W = width of street.

Corner Lots—sq. ft. per sq. ft. of lot = $\frac{2W_1 + W_2}{120} + 0.5$

where W = width of wider street.

W_1 = width of narrower street.

Corner to extend not more than 100 ft.

For purposes of computation no street shall be taken as narrower than 50 ft. nor wider than 100 ft.

R-5 DISTRICT—(Apartments—medium density)

Use—Same as for R-4 District.

Height—One times width of street (for corner lots, one times width of wider street for a horizontal distance not to exceed 100 ft. from corner). For purposes of computation, no street shall be taken as wider than 100 ft.

Area of Lot—No restrictions.

Width of Lot—20 ft. minimum.

Percentage of coverage—Interior lots 45%
Corner lots 55%

Yards

Front—None.

Side—Courts to be function of sheer height; not less than required by M. D. L.

Rear—25 ft. or one-quarter the sheer height above yard, whichever is the greater.

Courts—To be function of sheer height with minimum dimension.

Floor Area Ratio

Interior Lots— $\frac{W}{40} + 0.5$ sq. ft. per sq. ft. of lot.

Corner Lots— $\frac{2W_1 + W_2}{120} + 1.5$ sq. ft. per sq. ft. of lot.

R-6 DISTRICT—(Apartments—central and dense areas)

Use—(1) Same as for R-4 District.

(2) Hotel.

Height—One times width of street (in case of corner lots, one times width of wider street for a horizontal distance not to exceed 100 ft. from corner). For purposes of computation, no street shall be taken as wider than 100 ft.

Above level equal to one times width of street, building shall set back one foot horizontally for each three feet of additional height; minimum setback, 10 ft. Tower may be built on 20 percent of lot area, set back 25 ft. from front and rear lot lines, and 10 ft. from side lot lines.

Area of Lot—No restrictions.

Width of Lot—20 ft. minimum.

Percentage of coverage—Interior lots 55%
Corner lots 65%

Yards

Front—None.

Side—Courts to be function of sheer height, but not less than required by Multiple Dwelling Law.

Rear—20 ft. or one-quarter the sheer height above the rear yard, whichever is the greater.

Courts—To be function of sheer height, with minimum dimensions.

Floor Area Ratio

Interior Lots—sq. ft. per sq. ft. of lot = $\frac{W}{40} + 1.5$

where W = width of street.

Corner Lots—sq. ft. per sq. ft. of lot = $\frac{(2W_1 + W_2)}{120} + 3.5$

where W_1 = width of wider street.

W_2 = Width of narrower street.

Corner to extend not more than 100 ft. For purposes of computation, no street shall be taken as narrower than 50 ft. nor wider than 100 ft.

R-4A DISTRICT—(Garden Type Apartments with retail stores on ground floor).

Use—(1) Same as R-4.

- (2) Retail stores on ground floor including shop for custom work or for repairs to clothing, shoe repair shop.
Other provisions same as R-4.

R-5A DISTRICT—(Apartments with retail stores on ground floor).

Use—(1) Same as R-4A.

- (2) Other provisions same as R-5.

R-6A DISTRICT—(Apartments with retail stores on ground floor).

Use—(1) Same as R-4A plus hotels.

- (2) Other provisions same as R-6—except that hotels must have side yard or provide loading space within building as required in B-2 District.

ARTICLE III—BUSINESS DISTRICTS

B-1 DISTRICT—(Stores and Dwellings)

Use—(1) A use permitted in Districts R-1, R-2, or R-3.

- (2) Store for retail trade.
(3) Shop for custom work or for repairs to clothing. Shoe repair shop, bake shop, candy shop.
(4) Bank, Office or studio normally employing not more than 5 people, provided business is incidental to retail trade.

For buildings devoted exclusively to non-residential uses:

Height—25 ft. or 2 stories, whichever is the most restrictive.

Area of Lot—No restrictions.

Width of Lot—20 ft. minimum.

Percentage of coverage—Interior Lots 60 percent
Corner Lots 70 percent

Yards

Front—20 ft. or 20 percent of depth of lot, whichever is least restrictive.

Side—None.

Rear—20 ft. or 20 percent of depth of lot, whichever is least restrictive (interior lots only).

Courts—None required, but if provided must conform to minimum dimensions to be fixed.

Floor Area Ratio

Interior Lots—1.5 sq. ft. per sq. ft. of lot.

Corner Lots—1.70 sq. ft. per sq. ft. of lot.

For buildings devoted in whole or in part to residential uses:

All above restrictions to be the same as for R-3 District.

B-2 DISTRICT—(Central Retail)

Use—(1) A use permitted in B-1 and R-6A.

- (2) Hotel.
(3) Office building.
(4) Repair or light manufacturing provided such operation is incidental to the conduct of a retail business on the premises, and further that not more than 5 percent of the total floor space of the building is so used.

Height—One times width of street (in case of corner lots, one times width of wider street for a horizontal distance not to exceed 100 ft. from corner). For purpose of computation, no street shall be taken as wider than 100 ft. Above level equal to one times width of street, building shall set back one foot horizontally for each three feet of additional height, minimum set back, 10 feet. Tower may be built on 20 percent of lot area, set back 25 feet from front and rear lot lines, and 10 feet from side lot lines.

Area of Lot—No restrictions.

Width of Lot—20 ft. minimum.

Percentage of coverage—Interior Lots 80 percent.
Corner Lots 90 percent.

Yards

Front—None.

Side—10% or loading space within building equivalent to 2% of total floor area of building for retail stores and hotels only.

Rear—15 ft. or 15%.

Courts—To be a function of sheer height, with minimum dimensions.

Floor Area Ratio

Interior Lots—sq. ft. per sq. ft. of lot = $\frac{W}{40} + 4.5$

where W = width of street

Corner Lots—sq. ft. per sq. ft. of lot = $\frac{(2W_1 + W_2)}{120} + 9.5$

where W₁ = width of wider street.

where W₂ = width of narrower street.

Corner to extend not more than 100 ft.

For purposes of computation, no street shall be taken as narrower than 50 ft. nor wider than 100 feet.

Loading Space—200 sq. ft. per 10,000 sq. ft. of floor area for loft, storage, hotel and store buildings. This space may be in part or in whole in the rear yard and/or side yards and courts.

B-3 DISTRICT—(Central Business.) (Stores, loft, office building, theatre, etc.)

Use—(1) Same as B-2.

- (2) Loft building; theatre; moving picture theatre; assembly hall; public dance hall; bus stations (provided all loading is off street); motor vehicle sales room (not including service station nor repair facilities); parking type garage for motor vehicles (with service facilities entirely within building and not including repair facilities) to be permitted only on special approval of the Board of Standards and Appeals, and provided that entrance and exits are at least 150 feet from nearest corner; printing or newspaper plant; central telephone exchange; light manufacturing (as now provided in "retail" zone).

- (3) Other provisions same as B-2, except that 2% loading space required also for loft, store and printing buildings, as well as retail stores and hotels.

B-4 DISTRICT—(Business sub-center) (Outlying business districts)

Use—(1) A use permitted in B-3 District.

- (2) Ice Delivery Station.
(3) Bath House.
(4) Electric Substation.
(5) Garage or parking space for motor vehicles. Service station or repair shop for motor vehicles.
(6) Gasoline filling station.
(7) Wholesale business. Storage in bulk, or warehouse for such material as building material, contractor's equipment, clothing, cotton, drugs, dry goods, feed, food, furniture, hardware, ice machinery, metals, oil and petroleum in quantities less than tank car lots, paint, pipe, rubber, shop supplies, tobacco, or wool.
(8) Manufacture or industrial operation of any kind not heretofore listed and not listed as a permitted use in a B-5 District, or the Industrial District, and not listed as a special use in the Industrial District; provided that not more than 25 percent of the total floor space of the building is so used.

Height—One times width of street (in case of corner lots, one times width of wider street for a horizontal distance not to exceed 100 ft. from corner). For purposes of computation, no street shall be taken as wider than 100 ft. Above level equal to one times width of street, building shall set back one foot horizontally for each three feet of additional height; minimum setback, 10 feet. Tower may be built on 20 percent of lot area, set back 25 ft. from front and rear lot lines, and 10 ft. from side lot lines.

Area of Lot—No restrictions.

Width of Lot—20 ft. minimum.

Percentage of Coverage—Interior Lots 70 percent.
Corner Lots 80 percent.

Yards

Front—None.

Side—10% or loading space within building equivalent to 2% of total floor area of building.

Rear—(Interior Lots only) 20 ft. or one-fifth the sheer height above the rear yards, whichever is the greater.

Courts—To be a function of sheer height, with minimum dimensions.

Floor Area Ratio

Interior Lots—sq. ft. per sq. ft. of lot = $\frac{W}{40} + 3.0$

where W = width of street.

Corner Lots—sq. ft. per sq. ft. of lot = $\frac{(2W_1 + W_2)}{120} + 6.5$

where W_1 = width of wider street.

W_2 = width of narrower street.

Corner to extend not more than 100 feet. For purposes of computation, no street shall be taken as narrower than 50 ft. nor wider than 100 ft.

Loading Space—200 sq. ft. per 10,000 sq. ft. of floor area for loft, storage, hotel and store buildings. This space may be in part or in whole in the rear yard and/or side yards and courts.

B-5 DISTRICT—(Central Wholesale)

Use—(1) A use permitted in B-4 District.

(2) Lodging House.

(3) Hospital or Sanitarium.

Height—Same as B-4 District.

Area of Lot—No restrictions.

Width of Lot—Same as B-4 District.

Percentage of Coverage—*Interior Lots* 80 percent.

Corner Lots 90 percent.

Yards

Front—None.

Side—Same as B-4 District.

Rear—15 ft. or 15%.

Courts—Same as B-4 District.

Interior Lots—sq. ft. per sq. ft. of lot = $\frac{W}{40} + 4.5$

Floor Area Ratio

Corner Lots—sq. ft. per sq. ft. of lot = $\frac{2W_1 + W_2}{120} + 9.5$

Loading Space—Same as B-4 District.

S INDUSTRIAL DISTRICT

Use—(1) A use permitted in any Residence District, except a building intended to be used in whole or in part for residential use.

(2) A use permitted in any Business District.

(3) Long list of industries that are not seriously noxious or dangerous and do not emit dust, odor, gas,

(4) fumes, noise or vibration comparable in character or in aggregate amount with Special Industrial

(5) Uses, etc.

Special Industrial Uses

In addition to all uses listed as permitted uses, the following uses shall be allowed on special approval of the Board of Standards and Appeals.

(1) No industry will be absolutely excluded from the City of New York.

(2) Long list of noxious and dangerous industries, such as acetylene gas, ammonia, celluloid, petroleum refining, glue, offal reduction, explosives, etc., ending;

(3) Any industrial process emitting dust, odor, gas fumes, noise or vibration comparable in character or in aggregate amount to that of the uses listed as Special Industrial Uses.

(4) In an Industrial District, a building arranged, intended, or designed to be used in whole or in part for Residential Use may be permitted on special approval of the Board of Standards and Appeals, only.

Height—Same as for B-4 and B-5 Districts.

Area of Lot—No restrictions.

Width of Lot—Same as for B-4 and B-5 Districts.

Percentage of coverage—*Interior Lots* 80 percent.

Corner Lots 90 percent.

Yards

Front—Same as for B-4 and B-5 Districts.

Side—Same as for B-4 and B-5 Districts.

Rear—Same as for B-4 and B-5 Districts.

Courts—Same as for B-4 and B-5 Districts.

Floor Area Ratio

Interior Lots—sq. ft. per sq. ft. of lot = $\frac{W}{40} + 3.0$

Corner Lots—sq. ft. per sq. ft. of lot = $\frac{2W_1 + W_2}{120} + 6.5$

Loading Space—Same as for B-4 and B-5 Districts.

TABLE Z I
Summary of Provisions For All Districts—Proposed Building Zone Resolution
Suggested by the Staff of the Mayor's Committee on City Planning

District	Minimum Lot Size	Maximum Height	% of Lot Covered		Y a r d s		
			Interior	Corner	Front	Side	Rear
R 1—Single-family	8,000 sq. ft.	35' or 3-story	25	25	25' or 25%	15'+15' or 37.5%	25' or 25%
R 2—Single-family	5,000 sq. ft.	35' or 3-story	35	35	20' or 20%	9'+9' or 36.0%	25' or 25%
R 3—Single-family	3,750 sq. ft.	35' or 3-story	35	35	15' or 15%	7'+7' or 37.0%	20' or 20%
R 3—Two-family	5,000 sq. ft.	35' or 3-story	35	35	15' or 15%	7'+7' or 28.0%	20' or 20%
R 3—Single Row Houses	2,000 sq. ft.	2-story	25	25	15' or 15%	7' or (7xNo. Houses)	20' or 20%
R 4—M. F. Garden Type	NR	1xW	35	45	10' or 10%	10'+10' or 20.0%	30' or 1/2H
R 5—M. F. Apartments	NR	1xW	45	55	NR	Court	25' or 1/4H
R 6—M. F. Apartments	NR	1xW+Tower	55	65	NR	Court	20' or 1/4H
B 1—Local Retail Stores	2,000 sq. ft.	25' or 2-story	60	70	20' or 20%	NR	20' or 20%
B 2—Central Retail	NR	1xW+Tower	80	90	NR	10% or LS	15' or 15%
B 3—Central Business	NR	1xW+Tower	80	90	NR	10% or LS	15' or 15%
B 4—Business Sub-Center	NR	1xW+Tower	70	80	NR	10% or LS	20' or 1/5H
B 5—Commercial	NR	1xW+Tower	80	90	NR	10% or LS	15' or 15%
S —Industry	NR	1xW+Tower	80	90	NR	10% or LS	20' or 1/5H

Note: R 4A—M. F. Stores, ground floor—Provisions same as R 4.

R 5A—M. F. Stores, ground floor—Provisions same as R 5.

R 6A—M. F. Stores, ground floor—Provisions same as R 6.

NR—no restrictions.

1xW—1 times width of street.

H—sheer height above yard.

LS—loading space.

+Tower—Tower 20% of lot and set back at 3 to 1.

TABLE Z II Floor Area Ratios of Proposed Building Zone Resolution Proposed by the Staff of the Mayor's Committee on City Planning							
District	Interior Lots		Corner Lots			Formula	
	60' Street	100' Street	60/60 Street	60/100 Street	100/100 Street	Interior Lots	Corner Lots
R 1—Single-family	0.65	0.65	0.65	0.65	0.65	fixed	fixed
R 2—Single-family	0.80	0.80	0.80	0.80	0.80	fixed	fixed
R 3—Single-family	1.00	1.00	1.00	1.00	1.00	fixed	fixed
R 3—Two-family	1.00	1.00	1.00	1.00	1.00	fixed	fixed
R 3—Single Row Houses	0.60	0.60	0.60	0.60	0.60	fixed	fixed
R 4—M. F. Garden Type	1.50	2.50	2.00	2.60	3.00	W:40	(2W + w:120) + 0.5
R 5—M. F. Apartments	2.00	3.00	3.00	3.60	4.00	(W:40) + 0.5	(2W + w:120) + 1.5
R 6—M. F. Apartments	3.00	4.00	5.00	5.60	6.00	(W:40) + 1.5	(2W + w:120) + 3.5
B 1—Local Retail Stores	1.50	1.50	1.70	1.70	1.70	fixed	fixed
B 2—Central Retail	6.00	7.00	11.00	11.60	12.00	(W:40) + 4.5	(2W + w:120) + 9.5
B 3—Central Business	6.00	7.00	11.00	11.60	12.00	(W:40) + 4.5	(2W + w:120) + 9.5
B 4—Business Sub-Center	4.50	5.50	8.00	8.60	9.00	(W:40) + 3.0	(2W + w:120) + 6.5
B 5—Commercial	6.00	7.00	11.00	11.60	12.00	(W:40) + 4.5	(2W + w:120) + 9.5
S —Industry	4.50	5.50	8.00	8.60	9.00	(W:40) + 3.0	(2W + w:120) + 6.5

Note: Floor Area ratio is the relationship between square feet of floor space per square foot of lot.

Formula: Interior Lots W—street width.

Corner Lots W—wider street.

Corner Lots w—narrower street.

